



The Alberta Journal of Educational Research

Vol. XVII, No. 1

March, 1971

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FACULTY OF EDUCATION
The University of Alberta

CHARLES E. PASCAL
McGill University

Instructional Options, Option Preference, and Course Outcomes¹

The effects of offering three instructional options to students (N=185)—lecture, lecture with discussing, and independent study—were examined. Results indicate that students who received their preferred method of instruction showed a more positive attitude towards the course's area than students assigned to non-preferred methods. Receiving one's preferred option had no significant effect on cognitive outcomes. Several significant main effects of the methods on the cognitive outcomes were obtained, however.

The need to adapt instruction to individual differences is recognized by many students, educational psychologists and teachers. Researchers, too, have studied the effects of different methods of teaching on different kinds of students. While the results have not shown startlingly large effects, it still seems likely that some students benefit from methods of instruction ineffective for other students. Few studies (e.g. Haigh and Schmidt, 1956) have examined the effects of allowing students to *choose* and *experience* their preferred method of instruction.

If one grants the premise that teaching methods are differentially effective for different kinds of students, how can students be placed into classes where they will learn most effectively?

In the absence of effective computer matching of students and teaching methods (Cronbach, 1967) the most realistic solution may be student self-selection. It is argued by many progressive educators as well as students that only the student can determine what educational experiences will be most meaningful to him as an individual. The present research was designed to put that assertion to the test.

¹ The author is grateful to Dr. W. J. McKeachie for his help in this research and valuable comments for the preparation of this paper. This paper was part of a presentation made at the annual meeting of the American Educational Research Association, Minneapolis, March 4, 1970.

Problem

This study investigated the effects of offering three instructional options (lecture, lecture and discussions, and independent study) to students in a large lecture. In addition to studying whether or not students do better when given their preferred method of learning, the study investigated the possible differential effectiveness of the three methods on different instructional outcomes.

Hypotheses

Hypotheses 1-3 deal with the effects of receiving ones' preferred method of instruction while the latter three are concerned with the methods' main effects on the course outcomes (e.g. cognitive and affective measures).

Hypothesis 1: Students who receive their preferred option will perform significantly better in the course (i.e., receive higher grades) than students who do not receive their first choice.

Hypothesis 2: Students who receive their preferred option will indicate a more favorable attitude towards the course's field than students who do not receive their first choice.

Hypothesis 3: Students who receive their preferred option will rate the course as more valuable than students who do not receive their first choice.

Hypothesis 4: Students in the lecture and lecture-discussion options will perform better on the knowledge and comprehension items on the criterion test than the independent study students.

Hypothesis 5: Students in the lecture-discussion option and the independent reading option will perform better on the "application" part of the criterion test.

Hypothesis 6: Independent reading students will be better at evaluating a novel reading.

Procedures

Subjects

The subjects for the research were 185 students enrolled in "Socialization," a Psychology course at the University of Michigan during the Spring Semester in 1969.

Method

Students were given the following descriptions of three instructional options and were asked to indicate their preferences for each:

1. Independent Study

Students in this method have an independent reading experience. Students are *not* expected to attend lectures and are *not* required to take examinations. The independent reading students are expected to do considerably more reading (8-10 hours weekly) since they have more time available because they do not have to attend lectures.

Each student works out his own reading program with the instructor. This program is determined in part by the course syllabus and

in part by the student's own particular interests. That is, the student is encouraged to *explore* readings in the library which are both relevant to the course and of interest to the student.

Two written projects are required:

a. *Reading Log*:

Includes brief abstracts of the readings and more important includes student's personal comments, criticisms, applications, and evaluations of each reading. Students hand in the log twice during the semester for comments.

b. *Term Paper*:

A paper on any topic of the student's choice.

2. *Lecture*

Students in this method take the course strictly as a lecture course. Students are expected to attend lectures and read the required material on the course syllabus. They take a midterm and final exam and write a term paper on the topic of their choice.

3. *Lecture and Discussion*

Students in this method also take a midterm and final exam and write a term paper. But, in addition, these students also attend a discussion group every other week (in addition to lectures). These student discussions are based mainly on the case material. Therefore, students should plan to do the appropriate reading *before* each discussion session to insure productive discussions.

The students were told that they were participating in an evaluation of this instructional technique and that everyone would not be able to get their first choice.

A minimum of fifty students were then assigned to each of the three instructional options. About one-half of each group were randomly assigned to the option which they listed as their first choice; the other half of each group found themselves randomly placed in an option which was either their second or third choice. Students who were placed in their first choice will be referred to as "Preferred" students and those who did not receive their first choice are labelled "Non-preferred".

Because an unequal number of students chose each of the options and because it was decided that, if possible, no student would be assigned an option he labeled "definitely not," it was difficult to obtain equivalent sample sizes in each cell. Table 1 indicates the number of subjects by cells in the experimental design.

Instruments

Criterion Test. The criterion test used to measure cognitive achievement consists of two levels of items. Level I contains 31 items (112 points) and corresponds to items which measure Bloom's (1956) Knowledge and Comprehension objectives. Level II of the criterion test consists of 8 items (65 points) which measure Application of the course material. (The post-course form contained two additional items for this level.) Most of the items were drawn from the instructor's previous exams while several were obtained from Carrier's (1966) criterion test.

TABLE 1
NUMBER OF SUBJECTS BY PREFERENCE IN EACH
INSTRUCTIONAL OPTION

Preference	Instructional Option			Totals
	Independent Study	Lecture	Lecture Discussion	
First Choice	37	44	25	106
Not First Choice	23	31	25	79
Totals	60	75	50	185

A key was developed for scoring the essay or "application" items as a result of consultation and discussion with the instructor regarding the objectives and correct answers for each item. The test was scored without the knowledge of students' names and experimental status (code numbers were used throughout the study). A scoring-rescoring reliability was obtained from a sample of 20 tests and was found to be .98 (time between scorings was one week).

It should be added that the post-course administration of the criterion test preceded the final exam in the course (for lecture, and lecture and discussion students) by three weeks. This was done to insure equivalent "preparation" for independent study students and the other students. At the time of the final administration of the criterion test, all relevant material should have been read or heard by students across all options. By using a "grade-free" criterion test which preceded preparation (by lecture, lecture-discussion students) for the final exam, it was hoped that the "preparation" and "motivational" factors would be the same for all groups.

Attitude toward Psychology Questionnaire (Carrier, 1966). This questionnaire is designed to measure the students' attitude toward the field of Psychology and is composed of 20 Likert-type items. A pre- and post-course administration of this questionnaire was obtained and Analysis of Covariance was used to measure the treatment and preference factor effects of the experimental course.

Course Evaluation. This form contains many questions dealing with the students' feelings and reactions toward the course regarding things such as their evaluation of the course's activities, their intention to do additional reading in the area, their opinions about options, etc.

Evaluation of a Novel Article. Students were given a seven page article toward the end of the semester and were given the following instructions:

This exercise is to be completed by *all* students and will be used for borderline cases in grading. Please read the following study and integrate what you have learned in the course into an evaluation of the study. That is, compare, contrast, and apply the various theoretical approaches and perhaps your own personal experience to an *evaluation* of the case. The exercise should be completed *individually* and should not exceed two typewritten pages. Therefore, please organize your thoughts *before* typing your answer. It is to be handed in on the last day of classes, April 18th (Independent reading students hand it in with their final paper).

This exercise was scored according to the student's ability to address himself directly to an evaluation of the article; that is a student scoring an A characteristically brings in outside references and personal experiences when specifically relevant to an understanding of the case. In many cases an A evaluation concluded with appropriate recommendations and/or solutions to the problem. Students who presented an abundance of facts did not necessarily score high on this exercise; that is, some students used the case study as a vehicle for presenting much information whether relevant or not to the case. Therefore, succinct integration of course material was the essential criterion for an A score. Evaluations were scored on a three level scale: A, B, C. Scoring-rescoring reliability of .75 was obtained on a sample of twenty when anonymously scored; time between scoring periods was one week.

Results

The data reported in this section are results of two-way analysis of variance and covariance. The covariate design was used in three instances in which pre-course data were obtained. The *F* statistic testing the regression of the pre-course scores on the post-course was significant ($p < .01$) in each case substantiating the use of this design.

Grades. No significant main effects or interactions were obtained for grades in the course. Hence, Hypothesis 1 must be rejected.

Attitude towards Psychology. A significant main effect of the preference factor on attitude towards Psychology was obtained as noted in Table 2. Students in the "preferred" group indicated a more positive attitude towards Psychology than those in the "non-preferred" groups; therefore, Hypothesis 2 is supported.

Value of the Course. No significant main effects or interactions were obtained for this outcome; therefore, Hypothesis 3 must be rejected.

Knowledge and Comprehension of Course Material. As Table 3 indicates, a significant main effect of option assignment on knowledge and comprehension of course material was obtained. Students in the lecture-discussion and lecture option performed better, on this outcome, than independent study students thus supporting Hypothesis 4.

Application of Course Material. No significant findings were obtained with respect to this outcome; therefore, Hypothesis 5 must be rejected.

Evaluation of a Novel Article. Table 4 reports a significant main effect of option assignment on this outcome: the independent study students scored better than did those students in the other two options.

TABLE 2
ATTITUDE TOWARDS PSYCHOLOGY
(Two-way analysis of covariance)

Source of Variation	D.F.	M.S.	F	Sig.
Options	2	59.16	1.33	ns
Preference Factor	1	306.97	6.92	.01*
Interaction	2	10.73	0.24	ns
Error (within cells)	125	44.35		

*Estimate of Main Effects of Preference Factor:

<i>Preferred</i>	<i>Non-Preferred</i>
1.5540429	-1.5540429

Students who scored high on this exercise were more apt to address themselves to an evaluation of the article bringing in relevant readings and personal experience to illustrate their points. They were also more succinct and indicated that more organization preceded the final writing of their reaction report. These data support Hypothesis 6. Many students, however, used the article as a vehicle for presenting the basic concepts of some or all of the theorists dealt with in the course. In many cases, much course knowledge was presented but was relatively *independent of an evaluation and solution* of the article's material.

TABLE 3
KNOWLEDGE AND COMPREHENSION OF COURSE MATERIAL
(Two-way analysis of covariance)

Source of Variation	D.F.	M.S.	F.	Sig.
Options	2	1156.52	24.98	.001*
Preference Factor	1	80.05	1.72	ns
Interaction	2	4.54	0.00	ns
Error (within cells)	125	46.29		

*Estimate of Main Effects of Options:

<i>Ind. Study</i>	<i>Lecture</i>	<i>Lec-Discussion</i>
-5.8420937	1.9681104	3.8739833

For this reason, the articles were recoded and were scored for the *amount* of course knowledge presented in the reaction reports. The findings (Table 5) of this analysis indicate that both lecture and lecture-discussion students used significantly more course knowledge in their evaluations ($p < .01$) than independent study students (scoring reliability was .83). Thus, there was a distinct difference in the way students in the independent study option and those in the other two options dealt with this particular assignment: independent study students paid more attention to an evaluation of the article, were more succinct in their reports, and brought in theoretical support when it was needed to explain a point, whereas students in the other two options used the assignment to present as much course knowledge as possible.

TABLE 4
EVALUATION OF A NOVEL ARTICLE
(Two-way analysis of variance)

Source of Variation	D.F.	M.S.	F.	Sig.
Options	2	5.06	11.77	.01 ***
Preference Factor	1	1.65	3.84	ns
Interaction	2	0.38	0.88	ns
Error (within cells)	146	0.43		

Mean Scores				
	Ind. Study	Lecture	Lec.Dics.	
Preferred	1.86	2.51	2.19	2.19*
Non-Preferred	2.00	2.60	2.61	2.40
***	1.93	> 2.56	Δ 2.40	2.30 (grand Mean)

*Margins indicate one-way means; Scoring key: 1=A, 2=B, 3=C.

Additional Outcomes. In addition to these major outcomes, several other significant findings are worth mentioning. Non-preferred independent study students rated the course more difficult and anxiety provoking ($p < .01$) than students who preferred this option.

Independent Study students rated the term paper assignment more favorably ($p < .01$) than students in the other two methods. They also reported that they did more “non-required” work than lecture and lecture-discussion students ($p < .01$).

In response to the items “Course has caused me to be more creative than I normally am,” and “Course has been flexible enough to allow me

TABLE 5
NOVEL ARTICLE: SCORED FOR KNOWLEDGE
(Two-way analysis of variance)

Source of Variation	D.F.	M.S.	F.	Sig.
Options	2	8.20	14.72	.01 ***
Preference Factor	1	2.15	3.86	ns
Interaction	2	0.46	0.82	ns
Error (within cells)	146	0.55		

<i>Mean Scores</i>				
	Ind. Study	Lecture	Lec-Disc.	
Preferred	2.51	1.79	1.85	2.06*
Non-Preferred	2.75	1.85	2.30	2.30
***	2.63	> 1.82	& 2.08	2.18 (grand mean)

*Margins indicate one-way means; Scoring key: 1=A, 2=B, 3=C.

to pursue my own goals”, Independent Study students reflected significantly greater agreement with the item than students in the other options.

Students were generally in favour of having options (93.5 per cent positive, 6.5 per cent indifferent) and the majority reported that options provided them with “freedom and individualization” (91.6 per cent). Negative comments concerned the inability to change options (35.1 per cent) and the chance of not obtaining the requested option.

Students were asked to rate their agreement with several statements concerning the use of options. The mean ratings for each of these statements is reported in Table 6.

Discussion

Does it make any difference whether or not a student is given his choice of methods of teaching? The results of the present investigation revealed no differences in achieving the course’s cognitive goals as a function of receiving or not receiving one’s preferred option; and only one affective outcome was influenced by this factor: students receiving their first choice showed a more positive attitude towards psychology than students who did not receive their first choice. With respect to grades, course evaluation, and other outcomes, no differences were found (with the exception of difficulty of the course and anxiety *within* the independent study method).

TABLE 6
STUDENT OPINIONS ABOUT OPTIONS
(N=172)

Mean Ratings*	Opinions
1.78	A student can choose an option which best fits his particular style of learning and therefore performs better.
1.87	If possible, all courses should offer options.
2.15	A student increases his commitment to do the course work by being allowed to choose an option and therefore performs better in the course.
3.12	The more interesting the course, the less need for options.
3.23	It doesn't make much difference what method or option is available for a course, good students will perform just as well when not given a choice as they would if given one.

*Scoring Key: 1 = strongly agree
6 = strongly disagree

Perhaps one of the main reasons why more differences were not found due to the preference factor had to do with the instructor in the experimental course, who was well-liked. Student comments suggested that her lectures caused some to change their minds as to which option they preferred. By the same token, several students who had preferred the lecture but were assigned to the independent study control group reported that they had “come to prefer the independent study” option. Of the students responding to the phrase “The worst thing about options . . .”, 35.1 per cent reported that “being stuck with your choice when you find out that you’d rather be in another option.” This suggests that students do not always know the option with which they will be most pleased; but this also suggests that perhaps students should be given a brief opportunity to alter their original choices to eliminate this problem or perhaps be exposed to each option for a short period of time.

The study also lends support to the notion that instructional methods are differentially compatible with course goals. For example, it has been shown that recall of knowledge is facilitated by the lecture and that evaluation of a novel article is better taught by the independent study method.

In addition to cognitive outcomes, an instructor may have affective objectives which are more compatible with one method than another. Although the study revealed few overall differences in achieving the course’s affective goals, it is still very possible that methods do differ with respect to promoting certain affective goals. For instance, assume that an instructor would like his students to be more independent in pursuing knowledge as a result of his course. Intuitively, it would seem

TABLE 7
SUMMARY OF FINDINGS

Outcomes	Findings*
A. Knowledge and Comprehension of Course Material	L & L-D > I (p < .001)
B. Application of Course Material	ns
C. Evaluation of a Novel Reading	I > L-D & L (p < .01)
D. Grades	ns
E. Attitudes towards Course's Field	P > NP (p < .01)
F. Rated Value of Course	ns
G. Novel Reading: Scored for Knowledge	L & L-D > I (p < .01)
H. Difficulty of Course	INP > IP (p < .01)
I. Anxiety in Course	INP > IP (p < .01)
J. Value of Term Paper	I > L & L-D (p < .01)
K. Non-Required Work	I > L & L-D (p < .001)
L. Rated Course Flexibility	I > L & L-D (p < .001)
M. Rated Course's Influence on Creativity	I > L & L-D (p < .01)

*Key: I = Independent Study
 L = Lecture
 L-D = Lecture & discussion
 P = Preferred (students who received preferred option)
 NP = Non-Preferred

most likely that the independent study option, in which the students may be reinforced for independent behavior, would be most compatible with achieving this objective.

In summary, the present study suggests that students were in favour of having a choice of options and that they sometimes made "bad" choices; but whether or not an instructor makes use of options must depend on his course objectives and the priorities of these objectives. If the instructor's primary goal is to have the students be pleased with the opportunity to choose their own method of learning then offering options can be an end in itself.

If his only major goal is to develop independent thinking then perhaps he should have all of his students exposed to independent study. Instructors vary greatly according to the types of objectives they have, and the extent to which they consider the personal goals of their students in planning their courses. There can be no doubt that an instructor who offers different options is allowing students a greater opportunity to pursue

what they *think* are their own goals or optimal ways of learning; but at the same time, other goals may be sacrificed. It is therefore important that an instructor accept or reject, and design and evaluate, options with these priorities in mind.

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A. B. HERMAN
The University of Calgary

Effects of High School Program Choice on Self-Concept

The purpose of this study was to determine if there was a difference between the self-concept and the ideal self-concept in matriculation and non-matriculation students. A 51-item Q sort was administered to 305 Grade Ten students twice—once for determining actual self and once for ideal self. Variance of scores obtained showed no significant differences in self-concept between matriculation and non-matriculation students. Some differences occurred with sex and intelligence groups. Individual item analysis indicated Ss chief concerns were with appearance and attitude of others.

No one is born with the self—he becomes already predetermined. George Herbert Mead (1934) stated that the self is something which has a development. William James (1892), one of the earliest of the western world psychologists to concern himself with the subject of self, offered the view that the self is the function of the process of man's interaction with his environment. It is only within a social matrix, within the field of the social act, that the self arises. Each individual within a comparatively short time after birth has developed a large number of perceptions about himself. These perceptions of self are referred to as self-concept or actual self. The sum of the characteristics of self which the person feels are necessary to attain adequacy is called ideal self. This is the view an individual has of himself as he wishes to be. Bills, *et al.* (1951) define personal maladjustment as any discrepancy between the concept of actual self and the concept of ideal self. When an individual can make an overall evaluation of self and feel he is achieving basic need-satisfaction, he has attained self-adequacy and can move toward self-actualization.

The self-concept affects personal, academic and vocational growth within the school. Quinley (1967) showed that the student with an adequate self-concept, feeling that he can succeed, will put forth the necessary academic effort; however, the student with an inadequate self-concept, feeling that he cannot succeed, will not put forth the necessary

academic effort to achieve in school. Anderson and Olsen (1965) indicated that a high correlation between a person's appraised self and ideal self is concomitant with successful school adjustment and acceptance by others. Chambers and Lieberman (1965) reported that individuals with negative self-concepts made inadequate vocational choices.

Education should be a means which brings about a greater congruence between the student's self-concept and his ideal self-concept; that is, between how the student perceives himself and how he would like to be. To provide for individual differences, a variety of programs and a multiplicity of courses are offered to today's high school students. In providing this wide range of offerings, educators hope to achieve more readily the basic purpose of schools—that of self-actualization for each individual student.

Do many students entering high school desire to take a specific program but find they are not able to meet its entrance requirements? Do students in one program feel inferior to those in another program? Are students setting unrealistic goals for themselves? If answers to these questions are affirmative, then it could follow that, through selection of programs and courses, students are hindered from moving toward fulfilling their potential.

The Problem

The purpose of this study was to determine if there was a difference between the self-concept and the ideal self-concept in matriculation and non-matriculation students. Other variables investigated as possible causal effectors of differences between self-concept and ideal self-concept were sex of students, age, and intelligence.

Sample

Three hundred and five Grade Ten students were used in this study. The sample included 166 males and 139 females. The Ss ranged in age from 14 years 3 months to 19 years 0 months. Intelligence scores, in the form of percentiles, were recorded from Grade IX Departmental examination results. The total number of students having written the Ability Test for the year of this study exceeded 25,000. The spread in intelligence of the 305 Ss ranged from the first to the ninety-ninth percentile. One hundred seventy-four Ss were enrolled in a matriculation program, while 131 were enrolled in non-matriculation programs—vocational, business or general.

Method

A 51-item Q sort was used in the study. The items were drawn from a list of 100 self-referent statements developed by Butler and Haigh (1954), categorized according to a design originated by Stephenson (1952) and modified by Herman (1968). Samples of items included: "I am usually happy," "I get embarrassed easily", "I think clearly", "I worry about my health," and "I am as clean and neat as most people." The Q sort was administered twice, approximately one week apart. On the first sort, approximately one-half of the Ss (Group A) were asked to sort for actual

self, i.e., how they perceived themselves. The second half of the Ss (Group B) were asked to sort for ideal self, i.e., how they would like to be. On the second administration Group A sorted for ideal self and Group B for actual self.

Because measuring devices such as Q sort and various inventories are subject to social biases and piling of ratings at the favorable end of the scale, a check must be made to account for the social desirability factor. For this reason the Personality Research Form AA was administered to all the Ss.

The 51 statements of the Q sort were sorted into a forced distribution of 11 categories with the following number of statements in each category 1-2-4-6-8-9-8-6-4-2-1. Values assigned to the categories ranged from 0 to 10. The absolute differences between the actual self and the ideal self for the 51 items yielded a discrepancy score for each student. That is, when statement 1 was placed in category 4 in the actual sort and in category 9 in the self sort, the discrepancy score for that item was 5. The total of the absolute differences for each of the 51 items provided the discrepancy score for one S. A *t* test was used to ascertain whether significant differences existed between mean discrepancy scores for the matriculation group (M) and for the non-matriculation group (NM).

Findings

Results of comparisons made of various subject groups are shown in Table 1 below.

A *t* value of 0.95 indicated that there was no significant difference in discrepancy scores of matriculation and non-matriculation Ss in relation to self-concept. No significant differences were found when female Ss of M and NM were compared. Similar results were obtained upon comparison of the male Ss of M and NM.

Somewhat different results are indicated when the sexes were compared in each of the two groups. Although no significant differences were found between males and females within the M, significant differences did occur within the NM as a result of comparison of male and female Ss.

No significant differences occurred as a result of differences of age groups in either M or NM; however, significant differences did occur within both the M and NM with different intelligence levels.

Results from the Personality Research Form AA indicated that Ss scoring either high or low on the Desirability Scale had mean discrepancy scores on the Q sort that were not significantly different from the mean discrepancy scores of all the Ss in the study negating the factor of social desirability.

In analyses of differences of means for self-concept and ideal self-concept for both M and NM, it was noted that those statements which showed the largest discrepancy scores were similar for both groups. Similarly, statements showing the smallest discrepancy scores were common to both M and NM. A marked correlation between M and NM of .68 existed for the 51 items, indicative of consistency in differences of

TABLE 1
DIFFERENCES IN SELF AND IDEAL SELF

Subjects	N	Mean Discrepancy Score	t Value
Matriculation	174	88.88	
Non-Matriculation	131	90.96	0.95
Female M	81	90.10	
Male M	93	87.82	0.81
Female NM	58	94.97	
Male NM	73	87.78	2.21*
Female M	81	90.10	
Female NM	58	94.97	1.52
Male M	93	87.82	
Male NM	73	87.78	0.01
Above average intelligence M	91	87.29	
Average intelligence M	78	91.90	1.36
Above average intelligence M	91	87.29	
Below average intelligence M	5	81.80	2.46*
Average intelligence M	78	91.90	
Below average intelligence M	5	81.80	1.48
Above average intelligence NM	3	117.67	
Average intelligence NM	76	88.99	2.89*
Above average intelligence NM	3	117.67	
Below average intelligence NM	52	92.31	2.53*
Average intelligence NM	76	88.99	
Below average intelligence NM	52	92.31	1.00
Above median age M	87	88.52	
Below median age M	87	89.24	0.26
Above median NM	65	90.20	
Below median NM	66	91.71	0.39

* $p < .05$

self and ideal self scores between M and NM. This is indicated in Table 2.

Other results indicated in Table 2 show high correlations of the individual items for the groups being compared.

TABLE 2
Q SORT INTER-ITEM CORRELATIONS

Subjects	N	Difference of Mean Self and Mean Ideal Self	Pearson r
Matriculation	174	2.64	
Non-Matriculation	131	-1.91	.68
Male M	93	1.43	
Female M	81	0.57	.91
Male NM	73	-0.77	
Female NM	58	0.48	.82
Female M	81	0.57	
Female NM	58	0.48	.90
Male M	93	1.43	
Male NM	73	-0.77	.78

Discussion

Underlying the pursuit of this investigation was the assumption that the school plays a role in determining a student's percept of himself. If the school is serving equally all students according to their needs and abilities, then the students can develop to their highest potential. The ideal role that students feel they desire can be realized. Thus, disparities between self-concept and ideal self-concept should be no greater for one group of students than for another.

For this sample the data indicate that one high school program is neither superior nor inferior in the development of self-concept. One cannot, therefore, assume that a high school matriculation program will significantly improve the self-concept of all students; nor can one assume that students who indicate greater congruence with relation to actual self and ideal self will elect a matriculation program. It would appear that in order to accommodate all individuals, our education system must allow a pluralistic approach for the attainment of ideals.

Upon examination of individual statements from the 51-item Q sort it is noted that Ss' main concern is with their appearance. Items such as "I am good looking," "I am happy about my weight," and "I have poor skin," received high priority for the ideal self sort. Also of concern is their reaction to others. They strive to adjust to what embarrasses them and to overcome a reaction that reflects that their feelings have been hurt. The attitude of the peer group, as well as significant others, appears to be of great importance to them. The Ss want to be worthwhile members of a group. Again, such items as "I get embarrassed easily," "My feelings are easily hurt," and "I am clumsier than most people," were items indicative of largest discrepancy.

Although no significant difference between self-concept and ideal self-concept for the female and male M was shown, a significant difference did appear between the male and female NM. Of greatest concern to the female NM were body and bodily processes (weight problems, appearance) as well as relationship problems which could lead to nervousness, hurt feelings and embarrassment. Male NM were concerned with progress in school and personal appearance.

Some differences did occur with Ss of different intelligence groups. These may have been due to the relatively small number constituting the various intelligence level groups. Within the NM of 131 Ss, there were only three Ss that were classed as above average in intelligence. Similarly, within the M, only five of 174 Ss were classified in the below-average group.

If the addition of non-matriculation programs to school curricula shows no deleterious effects to students' self-perception and at the same time serves other educational functions, more exploration may be desirable in curriculum making to determine whether implementation of additional programs could be of benefit to students.

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LESLIE R. GUE
The University of Alberta

Value Orientations in an Indian Community

Educational histories of the majority of children of Indian ancestry in North America reveal a low level of school achievement, by white standards, and early drop-out. This study, using the theory and method of F. Kluckhohn for identifying and comparing value orientations, sampled 138 Indian pupils, 30 Indian parents, and 129 teachers and administrators in a northern Canadian school system. Highly significant differences in value orientations were found between Indian and non-Indian samples in the Relational value orientation area, together with a number of similarities. Differences were also found between Treaty and Metis pupils. The findings hold important implications for curriculum and program development.

Although the subject of value or values has been the concern of axiologists for many centuries, a bewildering array of definitions and descriptions is found in philosophical and other literature. Few would disagree, however, with Lepley's assertion (1957: 3) that the nature and status of value is one of the basic issues for survival today. Jacob, Flink and Shuchman (1962), in an interesting and comprehensive review of the concepts of value, note the wide variety of definitions. Moore, for example, states that values are as indefinite as is the term "good," whereas Dewey suggests that "immediate likings or emotive expressions present themselves as candidates for value status" (p. 17).

Wright suggests (1963: 10) that value concepts seem to form triples of two value absolutes at each end with one value between them. Ruesch (1957: 27) distinguishes between four categories of value: preferential behavior, anticipatory behavior, efficacious behavior, and price. Such categories lead to a consideration of the difference between beliefs, attitudes and values. Clyde Kluckhohn (1951: 390) comments on the "voluminous and often vague and diffuse literature on the subject," but detects, in a survey of definitions, agreement that values refer to normative rather than existential propositions.

Each authority consulted seems to coin his own definitions, and many then proceed to construct instruments to measure whatever term was used at the outset.

For purposes of the study reported here, *attitudes* were taken to mean a state of readiness to respond, to refer to the individual, not the object, and to exclude imputations of the desirable. *Beliefs* were considered to be those phenomena which are accepted by the individual as real or possible, true or false, correct or incorrect, without necessarily being accompanied by objective evidence or a commitment to action. *Values*, following the definition proposed by Jacob *et al.* (1962: 10), were considered to be "the normative standards by which human beings are influenced in their choice among the courses of action which they perceive."

Measurement of Values or Value Orientations

In recent years, a number of social scientists have attempted to measure values or value orientations, both across and within cultures. Morris (1956), using his "Ways to Live" instrument, tested 5,568 college students in China, India, Japan, Norway, Canada and the United States. He found, among many other things, that Asiatic peoples are more tolerant of cultural diversity between groups than are Western peoples. However, the Western groups tolerate more individual or psychological diversity than do the Asiatic groups. Dahlke (1958) has developed a typology of value orientations under the rubrics *religious*, *nativist*, *market*, *common man*, and *humanist*. Von Mering (1961) posited and tested a theory containing thirty-six value categories in four realms of value experience. In two communities in the Southwestern United States he discovered prominent diverging value drifts, value clusters, and strong evidence of the complexity of the valuing process.

Foster, Katz and Otto (1966) used one open-ended question with a sample of teachers, parents and pupils in four communities in the United States. A content analysis of the answers produced a typology of fifty values in twelve value clusters. Rath (1966) emphasized the matter of process in valuing, and identified three: choosing, prizing, and acting. Concepts which other authorities label "values" he classifies as "value indicators." A strong component in Rath's theory is the use with pupils in schools of a list of thirty "clarifying questions" or of a "value sheet", in order to help them identify their own values.

In testing twelve value scales with fraternity and sorority members at the University of Colorado, Scott (1965) found, among many things, that greater homogeneity of values existed among sorority members than among fraternity members, and that the normative pressures of a fraternity house did *not*, over time, cause younger members to adopt the values of the older members. Scott defines a value as

. . . an individual's concept of an ideal relationship (or state of affairs) which he uses to assess the "goodness" or "badness," the "rightness" or "wrongness," of actual relationships that he observes or contemplates. (p. 3).

Rokeach (1968: 159-60) proposes that values may be either terminal, referring to desirable end-states of existence, such as "peace," or instrumental, referring to desirable modes of conduct, such as "generosity." Testing of his theory has produced evidence of strong regional differences in values in the United States.

The Kluckhohn Theory of Value Orientations

Florence Kluckhohn (1961, 1963) has developed a theory of value orientations, and a method of testing for variations in such orientations. Kluckhohn conceives value orientations as complex, patterned principles resulting from the interplay of cognitive, affective and directive elements in the evaluative process. This transactional process, it is held, gives order and direction to human acts and thoughts in relation to what are termed “common human problems.” Table 1 shows the problems, phrased as questions, and the title of the value orientation “area” used to describe the problem.

TABLE 1
COMMON HUMAN PROBLEMS AND VALUE ORIENTATION AREAS*

Problem	Value Orientation Area
1. What is the modality of man’s relations to other men?	Relational
2. What is the temporal focus of life?	Time
3. What is the relation of man to nature?	Man-Nature
4. What is the modality of human activity?	Activity
5. What is the character of innate human nature?	Human-Nature

*Adapted from Kluckhohn (1963, p. 222).

The five problems tentatively singled out by Kluckhohn are not thought to be exhaustive, but to present a first statement, capable of expansion and refinement. A crucial part of the theory holds that the answers to the problems are not random nor limitless, but fall into definite, rank-ordered patterns with three possible positions, reminiscent of Wright’s triples (1963: 10). Kluckhohn’s formulation of the possible range of value orientations is set forth in Table 2.

A brief explanation of some of the terms in Table 2 may assist in discussion of the findings. In the Relational area, *Lineality* stresses the primacy of group goals continuous through time, as in hereditary and kinship structures such as aristocracies. *Collaterality* emphasizes the primacy of the goals of the laterally-extended immediate group; discontinuity in group allegiance is possible. *Individualism* centers on the process of individual goal-setting with little reference to lineal or collateral groups. Concepts in the Time area appear self-explanatory to those cultures which have a linear concept of time.

In the Man-Nature area, *Subject-to-Nature* implies fatalism. *Harmony-with-Nature* implies no real separation of man, nature and super-nature (the Creator, if you wish). A concept of wholeness springs from this orientation. *Mastery-over-Nature* describes the view that natural forces of all kinds are to be overcome and put to the use of mankind.

TABLE 2

KLUCKHOHN'S VALUE ORIENTATION AREAS AND RANGE OF VALUE ORIENTATION POSITIONS POSSIBLE IN EACH AREA

Value Orientation Area	Range of Possible Value Orientation Positions		
Relational	Lineality	Collaterality	Individualism
Time	Past	Present	Future
Man-Nature	Subject-to-Nature	Harmony-with-Nature	Mastery-over-Nature
Activity	Being	Being-in-Becoming	Doing
Human Nature	Evil	Neutral:Mixture of Good and Evil	Good
	Mutable-Immutable	Mutable-Immutable	Mutable-Immutable

NOTE—Since each of the orientations is considered to be independently variable, the arrangement in columns of sets of orientations is only accidental. Any orientation can appear in any column.

In the Activity area, *Being* is an orientation favoring the spontaneous expression of that which is conceived to be “given” in the personality; it is not license. *Being-in-Becoming* is a developmental orientation, displaying the desire to improve what is “given” in the personality. A *Doing* orientation focuses on activity measurable in terms of standards outside the person himself.

Discussion of the terms in the Human-Nature area is not necessary here, as the area was not tested in the study being reported here.

Kluckhohn's Methodology

The methodology for testing the value orientation patterns is to present a simulated real-life situation, and ask for the respondent's views as to who had the best and next-best idea. An example of an item follows.

Wage Work

Three men were talking about three different ways of working. Each man had a different idea.

———A One said, “I like being my own boss, and doing things my way. Then I can decide what to do, start when I like, and stop when I like, and work as hard or as long as I like.”

_____B The second man said, "I like to work for a big company where I get paid regular wages and where I have a general idea of how many hours a day I will work, and what will be expected of me."

_____C A third man said, "I like to work with a friend or several friends. We would work together as equal partners and decide what to do among ourselves."

Which man do you think had the best idea?

Which man had the next best idea?

The rankings of all items are summed and patterning tested by the use of Kendall's "S" (1962), binomial analysis as outlined by Kluckhohn and Strodtbeck (1961: 130-32), and the "Distance" concept proposed by Caudill and Scarr (1962). By the use of these methods, it becomes possible to compare one three-position pattern with another, as whole configurations, rather than emphasizing only the dominant or first-order preferences. Kluckhohn considers examination of the total patterning a crucial part of the theory, as the ranking of second and third-order preferences sheds much additional light on the differences between cultures and upon the process of cultural change.

Kluckhohn's theory and method were first tested in New Mexico, where, in a radius of twenty-five miles, five distinctive cultures can be found. Results of the "Five Cultures Study" (Kluckhohn and Strodtbeck, 1961) demonstrated that the theory and method could discriminate among the value orientations of different cultures, using relatively small samples.

Values and the Education of Indian Children in North America

In the four hundred seventy-nine years since Columbus stumbled upon North America, relationships between the white man and those whom he called Indians could be described as notably uneasy. This, in spite of Columbus' report to Ferdinand and Isabella in 1493 that the Indians demonstrated "great friendliness" and "excellent and acute understanding" (Montagu, 1965: 24). If this was an accurate observation, it becomes difficult to explain Indian wars, rebellions and uprisings, the continued social dependence of the Indian people, and the low educational achievement (by white standards) of Indian pupils in formal educational systems.

In a recent intensive study in Canada, Hawthorn (1967) states:

Retention in Grade one and the loss of students in any twelve-year period are alarming. In a period of twelve years, 8441 Indian students out of 8782 did not complete high school. (p. 130).

Similar findings have been presented regularly by other investigators such as Lagasse (1959); Knill and Davis (1967); Buckley, Kew and Hawley (1963); Card, Hirabayashi and French (1963); Wax and Wax (1964); and Fisher (1969).

A number of explanations are commonly put forward for the low achievement of Indian pupils, compared with their non-Indian peers.

One of these has been termed the "language barrier," a reference to the dual problem of children commencing school with little or no knowledge of English, and of the different thoughtways of different languages. This is a highly relevant part of the problem.

Many teachers have suggested that Indian children are genetically less intelligent than others. Some support for this viewpoint is provided by Jensen (1969: 52), although the issue is clouded by loose use of the word "disadvantaged." A different kind of evidence is presented in compelling form by MacArthur (1968), who reports, after extensive and thorough use of various instruments for measuring intelligence, that on some types of ability tests, Indian Metis children perform better than their urban, non-Indian counterparts.

Another hypothesis concerning the lower school achievement of Indian children is said to be "lack of motivation." The counter-argument holds that this lack of motivation is caused by a conflict between middle-class, white values and Indian values. It is reasoned that the explicit and implicit values of teachers and the standard curriculum repel the Indian child and cause him to lose interest in school and leave as soon as he can do so.

The Northern Schools Study

Problem

The study reported in this paper was an attempt to identify and measure, by the Kluckhohn theory and method, the value orientations of Indian and white cultures in northern Alberta, and to determine whether or not value conflicts do, in fact, exist between the cultures. The study was carried out in Northland School Division #61 in the province of Alberta, Canada (Gue, 1967). Northland Division serves all pupils in the isolated, forested area of the province, an area populated largely by people of Indian ancestry.

Method

A pilot study was conducted with thirty-five graduate students in Educational Administration at The University of Alberta; twenty-five Indian pupils and nine Indian parents in the rural hamlet of Calling Lake, Alberta; and seventy-five teachers in an urban school system in Alberta. As a result of the pilot study, two forms of the Kluckhohn instrument were developed. The first, for pupils and parents, was printed and also recorded in the Cree language for those parents preferring a Cree version. A parallel form of the instrument was developed for the use of teachers and administrators in the school division.

The samples consisted of 138 pupils, aged twelve and upwards, and thirty parents, all in the settlements of Wabasca and Desmarais, Alberta, and 129 teachers and administrators in Northland School Division. The instruments were administered by the investigator to the pupils and parents in Wabasca-Desmarais, and explained and distributed to the staff of the Division at its annual convention.

Data were analyzed to identify and compare the value orientation patterns of parents, pupils, and teachers and administrators according

to certain criterion variables. Only the major findings are reported in this paper.

"Treaty," "Non-treaty," and "Metis" Status

For purposes of clarity in analyzing the data of the study, the distinction between Indian persons who are "Treaty," "Non-Treaty," and "Metis" should be clearly understood. The history of these and related common terms follows.

Between August 3, 1871 and June 27, 1921, eleven major "treaties" were signed between certain Indian tribes of Canada and the Government of Canada (The Provincial Committee on Minority Groups, 1961). These treaties guaranteed certain rights to the Indian people who signed, including the establishment of reservations, provisions of educational services, "treaty money", hunting rights on Crown land, and a number of other matters. Such rights are passed down through male succession only, and continue to this day for about half of the people of Indian ancestry resident in Canada. Those Indian people and their offspring who did not sign treaty, those females who married out of treaty, and those who chose to legally remove themselves from "Registered Indian" status are known variously as non-Treaty Indians, Metis, or Half-Breeds. In many places in northern Alberta Treaty and Metis people live side by side, the Metis usually clustering on the borders of the reservation.

With the exception of the section analyzing differences between Treaty and Metis pupils, the term "Indian" as used in this paper refers to Treaty, Non-Treaty and Metis as one group.

Findings

The value orientation profiles of parents, pupils and teachers will be found in Table 3, using the symbolic notation developed by Kluckhohn and Strodtbeck (1961: 131-32).

Discussion

Several general observations can be made about the findings. The first is that the data clearly indicate the inaccuracy of common stereotypes of the values of the Indian people. Indian parents and pupils demonstrated a *Future* orientation in the *Time* area, and a self-developmental (*Being-in-Becoming*) orientation in the *Activity* area. In addition, Indian parents displayed a preference for a *Mastery-over-Nature* orientation in the *Man-Nature* area.

A second general observation is the fact that pupils differed markedly from both parents and teachers in the *Man-Nature* area, displaying a strong patterning of *Subject-to-Nature* as their dominant orientation. Possibly this reflects a combination of feelings of powerlessness stemming from sociocultural conditions in Indian settlements, together with typical adolescent anxieties and frustrations.

A third general observation is that the congruence of total patterning in the Indian parents' sample and the teachers' sample in three out of the four area (*Time*, *Man-Nature* and *Activity*) indicates a strong possibility for co-operation between Indian and non-Indian people in attempting to solve socio-cultural problems.

TABLE 3

VALUE ORIENTATION PATTERNS OF PARENTS, PUPILS,
AND TEACHERS IN NORTHLAND SCHOOL DIVISION #61

Value Orientation Area	Parents	Pupils	Teachers
Relational	Lin > Coll $\geq$ *Indiv	Lin > Coll > Indiv	Indiv > Lin > Coll
Time	Fut $\geq$ Pres > Past	Fut > Pres > Past	Fut > Pres > Past
Man-Nature	Mast $\geq$ Harm > Subj	Subj > Mast $\geq$ Harm	Mast > Harm > Subj
Activity	Bc $\geq$ Doing > B	Bc $\geq$ Doing > B	Bc > Doing > B

NOTE—The abbreviations are read as follows: Lin—Lineality; Coll—Collaterality; Indiv—Individualism. Fut—Future; Pres—Present; Mast—Mastery-over-Nature; Harm—Harmony-With-Nature; Subj—Subject-to-Nature; B—Being; Bc—Being-in-Becoming; D—Doing.

*The symbol $\geq$ indicates that the difference in preference between these two value orientation positions failed to reach the .05 level of statistical significance. The symbol > indicates that the preference between the two positions reached at least the .05 level of statistical significance.

A fourth, and undoubtedly the most culturally significant finding of the whole study, is the wide divergence between Indian and non-Indian value orientations in the Relational area. It will be noted that both Indian parents and pupils ordered their preferences as Lineality preferred over Collaterality preferred over Individualism ($L > C > I$), whereas the teachers and administrators preferred Individualism over Lineality over Collaterality ($I > L > C$). Kluckhohn (1963: 239) discusses a similar situation with regard to the Spanish-American people of New Mexico, using this as an illustration of the hypothesis that a demand upon a culture for too rapid a shift in value orientation patterns (e.g. placing a third-order preference in a first-order position) produces acute social and personality disorganization. Kluckhohn states that of the four value-orientation areas, (Relational, Time, Man-Nature and Activity), the Relational area is the most significant in producing stresses between cultures. Clearly, then, in northern Alberta, a school curriculum and teacher value orientations with a powerful preference for Individualism may be expected to continue to produce intense stresses within Indian pupils and parents who place Individualism in a low third-order preference position. These might be termed *external stresses*.

Another observation concerning the stresses produced by value orientation patterning centers around the "goodness-of-fit", concept proposed by Kluckhohn (1963: 226). This concept suggests that there should be a "strain towards consistency," present in the linking of the value orientation areas of a culture if the culture is to function relatively smoothly. For example, Individualism "fits," with a Future, Mastery-over-Nature, and Doing Orientation. In the Indian parent sample in this study, the mix of Lineality, Future, Mastery-over-Nature and Being-in-Becoming is a "bad fit," which could help to explain the social and personal disorganization reported as present in Indian communities. The pupil sample betrays an equally inconsistent nature in the attempt to blend orientations of Lineality, Future, Subject-to-Nature and Being-in-Becoming. The stresses present in these "goodness-of-fit," inconsistencies might be termed *internal stresses*.

Value Orientations of Treaty and Metis Pupils

A frequent point of discussion in the education of Indian children revolves around the possible differences in value orientations between Treaty and Metis children. Table 4 shows the results for both groups of pupils for items in the Relational and Time value orientation areas. Table 5 compares the two groups in the Man-Nature and Activity areas.

Discussion

Table 4 clearly shows that important differences exist in the crucial Relational area. Treaty pupils placed Individualism in third-order position, but Metis pupils tentatively advanced it to a second-order position, and their total patterning was much less decisive than that of the Treaty pupils.

In the Time area, although the final patterning of both samples was rank-ordered in the same manner, the indecisiveness of the Metis pupils came through quite clearly, as did different orderings in three individual items.

Table 5 shows considerable congruence between Treaty and Metis pupils in the Man-Nature area, although the indecisiveness of the Treaty pupils is noticeable in the total patterning, compared with the decisive fatalism of the Metis pupils in their first-order preference for Subject-to-Nature.

In the Activity area, however, the Metis pupils tentatively put a Doing orientation in first place, whereas the Treaty pupils placed Being-in-Becoming first. For both samples, however, the Being orientation was a clear last choice.

In summary, it will be noted that Treaty and Metis pupils differed in their dominant preferences in five out of twenty-four items, and in their second-order preferences in three other items. Total area patterns differed in two of the four areas. These differences were of sufficient magnitude to reject the view that no difference exists between Treaty and Metis value orientations.

It can be remarked that the combination of preferences for Doing and Individualism found in the Metis sample would be described as

TABLE 4
VALUE ORIENTATIONS OF TREATY AND METIS PUPILS
AGED TWELVE AND UPWARDS IN THE RELATIONAL
AND TIME AREAS

Item	Treaty Pupils	Metis Pupils
<i>Relational Area</i>		
1. Choice of Delegate	$C > I \geq L$	$I \geq L \geq C$
7. Help in Misfortune	$L > C > I$	$L > I > C$
11. Allocation of Recreation Grant	$C > I > L$	$C > I > L$
14. Wage Work	$L > C > I$	$L > C > I$
15. Family Work Relations	$C > L > I$	$C \geq L \geq I$
18. Welfare Assistance	$I > L > C$	$I > L > C$
21. Dropping Out of School	$L > C \geq I$	$L > I \geq C$
Area Pattern	$L > C > I$	$L \geq I \geq C$
<i>Time Area</i>		
3. Child Training	$F > P > Pa$	$F > P > Pa$
5. Expectations for Change	$P \geq F \geq Pa$	$Pa > P = F$
10. Philosophy of Life	$F > P > Pa$	$F \geq P > Pa$
17. Ceremonial Innovation	$F > P > Pa$	$P \geq F > Pa$
19. Going Away to School	$F > P > Pa$	$F > P > Pa$
24. Sudden Prosperity	$Pa = F > P$	$F \geq Pa > P$
Area Pattern	$F > P > Pa$	$F > P > Pa$

NOTE—Abbreviations in this table are read as follows:
L—Lineality F—Future
C—Collaterality P—Present
I—Individualism Pa—Past

a “good fit,” in the Kluckhohn theory. It follows that Metis pupils could be considered to have greater potential as change agents than Treaty pupils.

Patterning and Age of Pupils

In the Relational area, a most significant finding emerged in the total pupil sample, grouped according to age. For one year, at age fourteen, pupils moved Individualism from third- to second-order position. Younger and older pupils left it in a third-order position. This leads to speculation that for one year, close to the legal school-leaving age, Indian pupils were “trying out” white values—and rejected them.

TABLE 5
VALUE ORIENTATIONS OF TREATY AND METIS PUPILS
AGED TWELVE AND UPWARDS IN THE MAN-NATURE
AND ACTIVITY AREAS

Item	Treaty Pupils	Metis Pupils
<i>Man-Nature Area</i>		
2. Length of Life	S > M > H	S > M > H
6. Facing Conditions	S > M > H	S ≥ H ≥ M
9. Belief in Control	H > S > M	H ≥ S ≥ M
12. Use of the Environment	M > H > S	M ≥ H ≥ S
22. Hunting, Fishing and Trapping	M > S > H	M > S > H
Area Pattern	S ≥ M ≥ H	S > M ≥ H
<i>Activity Area</i>		
4. Job Choice	Bc > B > D	Bc ≥ B > D
8. Ways of Living	Bc > D > B	Bc > D ≥ B
13. Housework	D > Bc > B	D > Bc ≥ B
16. Non-Working Time	Bc > D > B	Bc ≥ D > B
20. Women in the Modern World	Bc > D > B	D ≥ Bc > B
Area Pattern	Bc ≥ D > B	D ≥ Bc > B

NOTE—Abbreviations in this table are read as follows:
S—Subject-to-Nature B—Being
M—Mastery-Over-Nature Bc—Being-in-Becoming
H—Harmony-With-Nature D—Doing

Implications

If the findings of this study represent a sampling of the differences in value orientations between the Indian people and the dominant Canadian society, powerful implications emerge for curriculum objectives, teacher education, guidance services, and educational administration.

Statements of the objectives of education usually contain covert or overt support for the value of individualism in life. Guidance and counselling services stress the importance of individual differences, and use a variety of techniques (many of which are culturally-biased) to establish the differences. Educational services are organized and administered in such a way as to separate or “stream” pupils according to presumed abilities in our individualistically-oriented culture. The highest rewards of the system are usually given to those who set and achieve high academic goals for themselves.

For the Indian child, achieving high academic goals may mean intellectual, physical and emotional separation from his parents, family

and culture. This a high price to pay in a culture where loyalties are still to the lineal group, not to individual success. The escape route for the Indian child seems to be to drop out of school and avoid the pressures of individualism. And what is true of the Indian child may also be true of the children of other cultures, frequently in crowded urban settings.

The study reported here indicates that a close examination of curriculum objectives and of the administration of educational services is needed, within some systematic theory of values or value orientations. The theory used might be that of Kluckhohn Rokeach, Raths, or other authorities in the field. Perhaps it would not be inappropriate to conduct the examination through several of the microscopes now available.

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ROGER A. CORMIER
Université de Montréal

Of Significant and Important Differences¹

One of the criteria that must be observed in the selection of a research topic is that the answer to the problem must be based on empirical data. There may be a tendency, however, to restrict researchable problems to those that could be analyzed with inferential statistical techniques. Examples show that investigators may be led to contradictory conclusions when these are based merely on statistical inferences. This is particularly true with the Fisherian approach. Unless or until researchers are ready to use the Neyman-Pearson or Bayesian approaches, it may be preferable to analyze data with descriptive statistics.

Introduction

Give a small boy a hammer, and he will find that everything he encounters needs pounding (Kaplan, 1964: 28).

One of the main criteria that a student or scholar must observe in the selection of a research topic is that the question be researchable, i.e., that the answer be based on empirical data (Davitz & Davitz, 1967: 3-4). If one looks at the content of introductory courses in research it seems that a very large proportion of time is given to the understanding of inferential statistical techniques. It is as if these techniques were *sine qua non* conditions of a researchable question. In discussing their fifth criterion in the evaluation of a research plan, Davitz & Davitz define researchable questions mainly in terms of empirical observations. However, in their guide concerning the appropriateness of statistical description and analysis they appear to place a restriction on the criterion of a researchable question by insisting on the importance of inferential statistical techniques (Davitz and Davitz: 27).

Do these techniques "provide a clearcut basis for answering the research question posed?" (Davitz and Davitz, 1967: 27) Further, if the

¹ The author wishes to thank Dr. Robert Bryce of the Department of Educational Administration at The University of Alberta for his valuable assistance in the revision of the written English of this article.

answer is clear-cut, what does it mean exactly? Stated somewhat differently—to form the basic problem discussed in this paper—does a *significant* difference mean an *important* difference or does the term *significant* have the same meaning in both statistical and non-statistical context.² Or, to use Clark's terminology (1963: 467-68) "What is the difference between statistical significance and substantive significance?"

Purpose of Statistical Tests

What is the purpose of a statistical test? In general, its purpose is to find out whether a statement about one or more parameters, or the null hypothesis, can be rejected or not. This decision is usually reached after the application of a statistical test to data consisting of a sample of observations drawn from a given population.

For example, suppose an investigator is interested in finding out whether a given group of students, say the entire population of students of The University of Alberta, have a different I.Q., as measured by a given instrument, than another group of students, say the entire population of students of the University of Calgary. In view of the fact that for practical purposes it may not be possible to test all students, the investigator draws a sample of students at random from each group and administers his instrument on these two samples. He then calculates the mean I.Q. in each group (hereafter referred to as X_i and X_j) and with the help of a statistical test tries to find out whether the mean I.Q. (hereafter referred to as U_i and U_j) in each population is unlikely to be the same. More precisely he attempts to ascertain whether the null hypothesis, that the mean I.Q. (U_i) of the entire population of the first group (all the U. of A. students) is equal to that (U_j) of the entire population of the second group (U of C), can be rejected at a given probability level of significance. If the null hypothesis is rejected, i.e., if there is a significant difference between X_i and X_j , the investigator may conclude that U_i is most likely different than U_j .

Statistical and Substantive Significance

Special attention should be given to the last statement. If the difference between X_i and X_j (the sample means) is statistically significant, it does not necessarily follow that the difference between U_i and U_j (the population means) is meaningful, important, substantive, or significant in the usual sense of the term. It merely means that U_i is most likely different than U_j ; it does not indicate to what extent the population means differ.

The difficulties involved in the testing of the null hypothesis were illustrated over thirty years ago by Berkson in his remarks on the application of the chi-square test. As he observed, since a large sample is preferable to a small one, and since the probability of rejecting the null hypothesis increases as the sample size increases, the statistical test may be futile (1938: 526-527).

² Significant is defined by the Grosset Webster Dictionary (1966, p. 526) as:

1. Meaningful; expressive; full of implication. 2. Indicative; symptomatic; having concealed meaning. 3. Important; crucial.

In the course of an experiment during which data were collected on 60,000 subjects, Bakan (1967: 6) ran several tests of significance, dividing the subjects into various groups, often according to arbitrary criteria, and found that the tests were always significant. A similar phenomenon was observed by Nunnally (1960) in calculating correlation coefficients on 700 subjects. As he points out,

. . . if the null hypothesis is not rejected, it usually is because the N is too small. If enough data is (sic) gathered, the hypothesis will generally be rejected. If rejection of the null hypothesis were the real intention in psychological experiments, there usually would be no need to gather data (p. 643).

Unfortunately, such basic problems are seldom mentioned in introductory inferential statistical or research methods textbooks. Two notable exceptions are the *Elementary Statistical Methods in Psychology and Education* by Blommers and Lindquist (1960: 310) and the *Research Methods in Social Relations* by Selltiz, Jahoda, Deutsch and Cook (1959: 422).

Illustrations with a t-Test

The distinction that must be made between a significant and an important difference will be illustrated with the help of various hypothetical situations.

Suppose there are four sets of populations each having two subsets, with the following characteristics:

- (a) Set I $U_1 = 99.5$ and $U_2 = 100.5$
 Set II $U_3 = 99$ and $U_4 = 101$
 Set III $U_5 = 98$ and $U_6 = 102$
 Set IV $U_7 = 96$ and $U_8 = 104$
- (b) The scores in each subset are normally distributed.
- (c) The variance in each subset is equal to 225
 (or $\sigma = 15$).

If investigators interested in these populations draw samples of various sizes, say of 25, 100, 250, 500 and 2,000 subjects, and obtain in each case by luck, but without their knowledge, sample means equal to the corresponding populations means, they would obtain various ratios as shown in Table 1.

The difference (eight) between U_7 and U_8 may be considered as more important than that (four) between U_5 and U_6 , the latter more important than that (two) between U_3 and U_4 , and the latter more important than that (one) between U_2 and U_1 .

When N is held constant, i.e., in each row, the value of the t ratio is directly proportional to the difference in the population means. In other words for samples of the same size the greater the significance of the difference (or the lower the alpha level) the greater is the t ratio for the difference. Likewise, if the difference in the population means is held constant, the greater the number of subjects, the greater is the t ratio. In this case, however, the relation is not directly proportional but only to the square root of N .

TABLE 1

OBSERVED VALUE OF t WHEN SAMPLE MEANS EQUAL
POPULATION MEANS UNDER VARIOUS SAMPLE SIZES†

N in each sample	$X_1=U_1=99.5$	$X_3=U_3=99$	$X_5=U_5=98$	$X_7=U_7=96$
	$X_2=U_2=100.5$	$X_4=U_4=101$	$X_6=U_6=102$	$X_8=U_8=104$
25	.24	.47	.94	1.88
100	.47	.94	1.88	3.77*
250	.74	1.49	2.98*	5.96*
500	1.05	2.10*	4.21*	8.43*
2,000	2.11*	4.22*	8.43*	16.87*

†Since the population variance is known, the critical value of t would be found in a z table.

* $p < .05$, assuming that the population variance is known by the investigators and that each of them is using two-tail tests.

If the results are compared obliquely instead of horizontally or vertically, the conclusions are not as simple. For instance in cell (4, 1), the t ratio for the difference ($t=1.05$) is greater than that in cell (2, 2) ($t=.94$). However, the difference in the population mean may be considered more important in the latter case (two) than in the former (one). In both cases, however, the null hypothesis, that $U_i=U_j$, at an alpha level of .05 would not be rejected and both investigators would have to suspend their judgement.

If cell (5, 1) is compared to cell (1, 5), the situation becomes paradoxical. In the former case an investigator would reject the null hypothesis, and thus find a significant difference although the difference in the population means is the lowest of the four sets of population, whereas in the latter case the investigator would not be able to reject the null hypothesis although the difference in the population means is much more important. Thus samples from populations with differences in means which could be considered as unimportant yielded "significant" differences whereas samples from populations having important differences in means would, under the circumstances noted here, be judged by an investigator as having non-significant statistical differences! The use of non parametric or free-distribution statistical tests in cell (1, 5) would not correct the situation since such tests are less powerful than parametric tests.

These contradictory results occur in rather ideal situations. In each case the sample mean would be equal to the population mean. Any investigator would like such a situation but none expects to encounter it.

But if such contradictory results could occur in such an ideal type of situation, one can imagine how much more contradictory results are likely to be in real situations where the sample means could rarely be equal to the population means.

These hypothetical situations include other ideal conditions or assumptions that are seldom met in real investigations. For instance in the example the population variances were homogeneous and were assumed to be known by the investigators. In addition the scores were assumed to be normally distributed and it was also assumed that each investigator would select a two-tail test and use the same alpha level (Winer, 1962: 13, feels that in some cases it would be more appropriate to use a .20 or .30 alpha level). Further, for each t test the number of subjects in each group was equal. Neither type I or type II errors were considered nor was the problem of power taken into account (as would have been the case in the Neyman-Pearson approach). Finally, there was no analysis of the various kind of losses attributed to each type of error (as would be required in the Bayesian approach).³

Among the factors that are usually under the control of an investigator only the number of subjects was varied in the previous hypothetical situations. When a certain percentage of the subjects selected at random fail to participate in the study, or when part of the data must be eliminated for one reason or another, the value of statistical inference is even more questionable.

Finally, in the examples presented in Table 1, the larger the difference between U_i and U_j the more the difference was considered as important. Such an assumption is valid when similar variables or factors are taken into consideration. There are situations where a slight difference or a small ratio (say 10,000/9,999) between two parameters may have important implications whereas in other situations a more substantial difference or a higher ratio (say 102/98) have relatively unimportant implications. However, in testing automatically in each instance whether $U_i = U_j$, investigators are blindly attaching the same importance to the null hypothesis. Furthermore, since a slight difference between two parameters may have important implications in a given situation, it follows that the statement made by Blommers and Lindquist (1960) that a "statistical significance is a *necessary condition* to the practical importance of any observed difference (p. 310)" is not necessarily valid for every situation.

Test on Populations

Some investigators even find it necessary to use inferential statistics when they have the *total* population.

There is even the practice of using tests of significance in studies of total populations, in which the observations cannot by any stretch of the imagination be thought of as having been randomly selected from any designable population. Using the P value in this way, in which the statistical inference model is even hinted at, is completely indefensible; for the single

³ Both the Neyman-Pearson and Bayesian approaches are discussed in Bakan (1967) and Clark (1963).

function of the statistical inference model is making inferences to populations from samples (Bakan, 1967: 13-14).

This problem may need further elaboration. Statistical tests such as *t* tests or analysis of variance, are based on the central limit theorem under which $\sigma_M = \frac{\sigma}{\sqrt{n}}$, i.e., the standard error of the mean of a random

sampling distribution (RSD) is equal to the population standard deviation divided by the square root of the size of the samples. For instance if the scores of a population are distributed normally as shown in Figure 1_a and samples of five subjects are drawn randomly from such populations, the long run average of the sample means would be distributed as shown in Figure 1_b. If the number of subjects per sample was increased to 50, the distribution would be as shown in Figure 1_c. As the number of subjects in each RSD increases, the shape of the curve becomes narrower and higher.

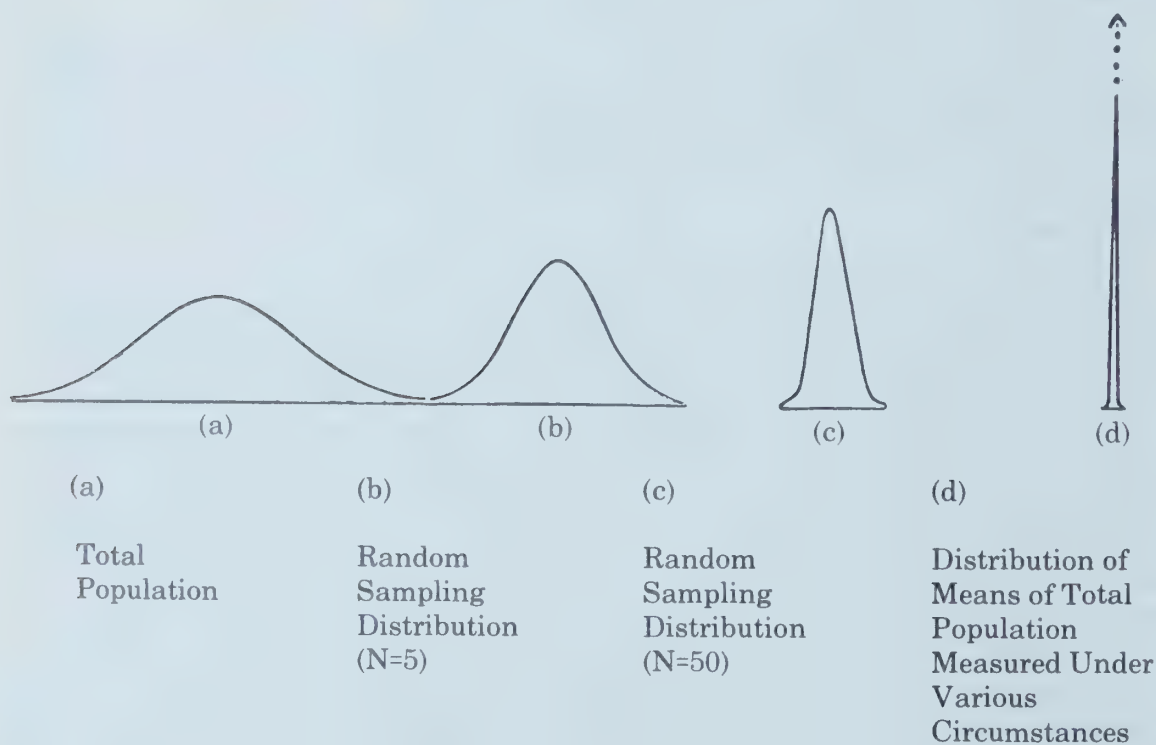


Fig. 1. Distributions under various situations.

If an investigator is using a whole population, say 50 observations, he cannot claim any longer that $\sigma_M = \frac{\sigma}{\sqrt{50}}$. Some investigators argue that they could test whether there is an error effect unique to each individual because of particular circumstances under which the measurement is made. If the measuring instrument is reliable, such error would be very small. Consequently σ_M would be very close to zero, in which case any *t*

test would be infinitely large or significant. In other words, if the measuring instrument is reliable, the total population mean should not vary to any great extent from one administration to the other and, consequently, the long run average of the means of the different administrations would be distributed as shown in Figure 1_a.

Correlation

The ambiguity of significant difference as related to alpha level is even more obvious when applied to a correlation coefficient. No one, in general, would be impressed by a coefficient of .10 in a given population since the ratio of the variance of the predicted scores to that of the criterion scores is equal to .01, or, as most often questionably indicated in statistical texts, there would be 1 per cent of the variance accounted for. If the correlation coefficient of two variables measured on 400 subjects drawn at random was equal to .10, the null hypothesis that the correlation coefficient of the population from which the sample was drawn is equal to zero at an alpha level of .05, could be rejected (Walker & Lev, 1958: 259). In other words, the correlation coefficient would be significant at an alpha level of 5%. But the rejection of the null hypothesis does not give any indication of the importance of the correlation coefficient in the population. It merely indicates that it is most likely different than zero. It may be only .01, for instance, in which case the ratio of the variance of the predicted scores to that of the criterion scores would be equal to only .0001.

Alternatively, a low correlation coefficient may be due to a curvilinear relationship. How may investigators verify if the linear assumptions is tenable by means of a scatter diagram or other method when they calculate a correlation coefficient? It would seem more important to verify this assumption rather than finding out if the correlation coefficient is significant.

Test for Trends

Similar misleading conclusions can be made in the interpretation of tests for trends. For instance, Kirk (1968: 116-123) refers to a hypothetical situation where an investigator is interested in the effects of sleep deprivation on hand steadiness. The findings are shown in Figure 2.

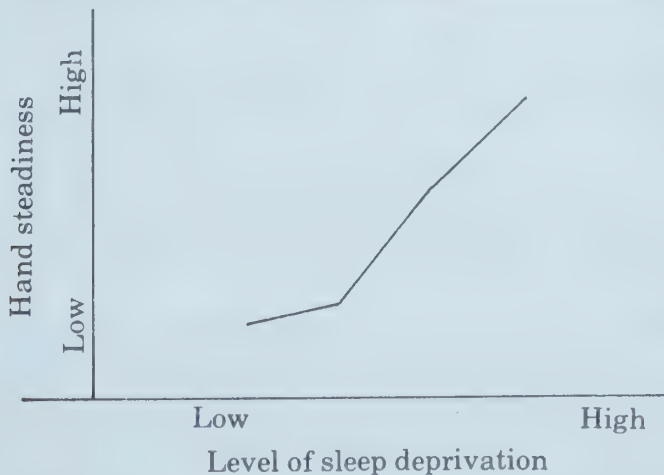


Fig. 2. Linear and quadratic test for trends (After Kirk, 1968: 116-123).

Both the test for the linear and the quadratic trends were significant. There does not seem to be any doubt, from inspection of Figure 2, that the linear trend is much more important than the quadratic trend. As Kirk points out, "of the 194.5 units of variation due to differences in sleep deprivation, the linear components accounts for 184.9, or 95.1 per cent of the variation (p. 122)." Attributing the same importance to these two trends because they are both significant may be quite misleading.

Effective Contributions or Goal Distortions

In the light of the remarks of the preceding pages, it may be appropriate to ask if the use of the Fisher approach in statistical analysis contributes to the improvement of any research design. It is possible that it does in certain cases. However, is the improvement such that it compensates for the efforts that investigators, especially graduate students, must invest in the understanding (or perhaps more precisely, some *form* of understanding) of statistical techniques?

According to the economic law of diminishing return, there is a point at which an increase in one factor of production, will yield a decline rather than an increase in marginal productivity, unless the quantities of the other factors are altered (Samuelson, 1958: 22-24). It may be appropriate to apply this law in educational research making sure that there is a proper balance between statistical techniques and other research techniques.

It is also possible that the attention that is given to statistical techniques obscures other research design problems. Speaking of the *law of instrument* Kaplan (1964) points out that:

It comes as no particular surprise to discover that a scientist formulates problems in a way which requires for their solution just those techniques in which he himself is especially skilled . . . What is objectionable is not that some techniques are pushed to the utmost, but that others, in consequence, are denied the name of science . . . Electronic computers, game-theoretic models, and statistical formulas are but instruments after all; it is not *they* that produce scientific results but the investigator who uses them scientifically. Paul Meehl . . . pointedly asks (in a paper with the question as title), when shall we use our heads instead of the formula (pp. 28-29)?

The danger is that instead of cultivating invention, educational institutions cultivate *procedures* (Kaplan, 1964: 15-16). It is even possible that procedures, especially statistical techniques, are not even cultivated at all. Some graduate students may merely apply statistical techniques in a cookbook approach with the consequence that their training in research may be very minimal or even detrimental. This phenomena may be compared to that of goal distortion and displacement usually present in bureaucratic organizations (Bacilious, 1968).

It is encouraging, however, to note that the *Review of Educational Research*, in its last issue (1969) on *Methodology in Educational Research*, has devoted only one chapter out of ten to statistical techniques as compared to the previous issue (1966) reviewing the same area in which case five chapters out of eight were devoted to statistical techniques. This may be an indication that researchable problems will less and less be made

synonymous with problems that could be analysed through statistical inferential procedures.

Possible Solutions

Statistical techniques should not be denied the status of scientific techniques either. This would be passing from one extreme to the other. There is a proverb in French that says: "La vertu reside dans le juste milieu." If the Fisherian approach includes many shortcomings, this does not mean that statistical techniques may never have their place in a research design. The Neyman-Pearson and Bayesian approaches, which have been used only to a very limited extent in behavioral sciences, may bring improvement in the formulation of research problems (Bakan 1967: 25-28; Clark, 1963: 458-464). However, both approaches, especially the Bayesian school, are much more complicated to use. According to Meyer (1969):

The teaching of Bayesian statistics is a good deal more difficult than teaching traditional methods. The students need to know more probability theory and more distribution theory. Since Bayesian theory is more resistant to a cookbook approach, a deeper understanding of underlying processes is necessary. They may be an advantage since it may reduce the common misuse of genuinely difficult concepts by those who have been taught to summarize data by reading the .05 value of t (p. 728).

The difficulties involved in the use of Bayesian statistics and those of other research techniques may be an indication that it will become more and more important to think in terms of teams of researchers where the talents of each individual could be used to fullest potential. If it remains essential that all graduate students receive training in research before leaving the university, it may not be essential that they acquire this training through the undertaking of individual theses or dissertations. This training could be acquired through their participation, during a certain period, in short range or long range research projects, undertaken by groups of staff members.

It may take a long time before university authorities accept such a setting. It is hoped, however, that the limitations of statistical techniques will be recognized by those concerned and that students will not be prevented from presenting and analyzing their quantitative data with the help of descriptive statistics, graphic presentation, statistical tables or any other means that may fulfill the purpose of their investigation. A book like that of Zeisel (1968) would be of great help in this regard.

Concluding Remarks

Some of the concluding remarks of Bakan's (1967) chapter on the test of significance may well summarize the main thoughts developed in this paper.

When we reach a point where our statistical procedures are substitutes instead of aids to thought, and we are led to absurdities, then we must return to common sense. . . . We must overcome the myth that if our treatment of our subject matter is mathematical it is therefore precise and valid. . . . *Mathematics can serve to obscure as well as reveal* (p. 28-29). (Italics added).

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B. C. CONKLIN,
H. A. ALTMANN,
and
HELEN HENGEL
The University of Calgary

Appropriateness of Problems for Discussion with Counsellors

The purpose of the present investigation was to examine the role of the high school counsellor as perceived by counsellors, principals, and counsellor educators. An attempt was made to discover what consensus exists among these three groups regarding the appropriateness of various topics for discussion with a counsellor in an Alberta high school. Results indicated that counsellor educators perceive all problem areas as equally appropriate for discussion with counsellors. Principals and counsellor educators were on agreement with counsellor educators on one factor (EV) but principals felt that personal problems (ASO, LRM) were less appropriate for discussion. As expected, counsellors themselves were between the two extreme positions in regard to personal problems. They ranked personal problems as more appropriate than did principals but less appropriate than did counsellor educators. The results were discussed in terms of a "conflict" hypothesis.

If the school counsellor is to become a professional with an important part to play in the total educational context, his role must be clearly delineated. All too often the function of the counsellor has not been made clear. It has sometimes been assumed that he deals to a large extent with the personal-social, educational, and vocational concerns of individual students; but many times the counsellor has simply performed those tasks assigned him by the administration. Part of the problem lies in the fact that counsellors themselves, because of no consistent educational background, are not certain about the functions they should be performing in the school setting. A role conflict emerges when the counsellor wants to function in ways which are incongruent with the principal's expectations.

Many research studies have been carried out investigating the perceived role of the school counsellor (Grant, 1954a; Warman, 1960;

Sweeney, 1966). The results of these studies indicate considerable difference of opinion about what a counsellor should be doing. Opinions seem to differ, particularly on the appropriateness of different topics to be discussed in interviews with students. Educators and researchers, generally, show disagreement in regard to the appropriateness of the personal social problem area as a topic for counselling interviews with students, whereas educational and vocational planning appears to be generally accepted as the counsellor's function. Grant (1954a, b) found that 50 to 80% of his sample of students, teachers, and administrators in the schools of New York City agreed that counsellors should do educational and vocational counselling. Only 4% of the students indicated that they would go to a counsellor with personal-emotional problems. It appears that the problem of agreement on perceived counsellor role has not been resolved in the American schools where counselling programs have existed for some time. The main points of disagreement seem to be: (a) the counsellor's role in the personal-social realm, (b) the assignment of duties to the counsellor, and (c) his relationship with the administration.

A review of the research in Alberta (Zingle & Winship, 1967; Altmann, 1969; West & Zingle, 1969; Ford & Koziy, 1969) indicates no agreement on the perceived role of the counsellor in Alberta schools. Thus it would seem that the situation in Alberta is similar to the American scene where there is, as yet, no careful delineation of counsellor role. The Ford and Koziy (1969) study focused on the student's and counsellor's perceptions of the counsellors role and found marked difference between them. The present research attempted to extend the examination of the perceived role of the counsellor by involving a significant number of high schools in the province. More specifically, it was the purpose of this study to determine whether there were significant differences among principals, counsellors, and counsellor educators in their judgment of the appropriateness of different topics for discussion with students in a counselling situation in Alberta.

Method

The Instrument

Warman's (1960) Counselling Appropriateness Check-List (WCAC) was the instrument employed in this study. All three groups in the study (counsellors, principals, counsellor educators) were asked to indicate on a 5-point scale the extent to which they considered each of the 66 items describing a problem appropriate for a discussion with a counsellor. The three factors found in the WCAC were College Routine, Vocational Choice, and Adjustment to Self and Others.

In May of 1969 the WCAC was sent to all Alberta high school counsellors, principals and counsellor educators. Two reminder letters were sent at two-week intervals and final returns were complete by the end of the first week in July. Of the 298 counsellors contacted, 188 responded to the WCAC giving a 68% return. One hundred and eighteen principals (all in schools with counsellors) responded to the

WCAC, representing a 69% return. Of the 20 university professors contacted, 14 returned their check-lists, giving a 70% return from this group.

A factor analysis using varimax rotation was performed on the scores obtained on the WCAC. This was followed by an analysis of variance to compare the scores of the three groups on each of the three factors derived. To make between-group comparisons, *t* tests were then applied.

An alpha level of .05 was chosen as the significance level acceptable throughout the study.

Results

Factor analysis, using Varimax rotation, of the WCAC produced the following three factors:

Factor 1, ASO (Adjustment to Self and Others), includes items such as wanting to be more popular, lacking in self-confidence, feeling timid, etc.

Factor 2, EV (Educational-Vocational), includes items concerning school routine; namely, ineffective use of study time, proper curriculum choice, choosing an occupation, etc.

Factor 3, LRM (Love, Religion, Morality), includes: being disappointed in a love affair, having to wait too long to be married, having conflicts about religion, etc.

Two items did not load on any of the three factors and were discarded leaving a total of 64 items.

The purpose of this research was to determine whether differences exist among counsellors, principals, and counsellor educators as to the rated appropriateness of various topics for discussion in a counselling situation in an Alberta high school. The problem areas were identified as ASO, EV, and LRM. Significant differences were found on the ASO factor ($F=44.49$; $df=2,281$; $p < .001$) and the LRM factor ($F=22.58$; $df=2,281$; $p < .001$). No significant differences were found for the EV factor.

Figure 1 gives a graphic representation of the general differences between groups on all three factors. This figure shows the average item score made by respondents from each group on the items in each problem area.

It can be seen that counsellors and principals considered the EV factor the most suitable of the three areas of problems for discussion with high school students, while counsellor educators placed ASO slightly higher in their hierarchy. Principals fell behind the other two groups in the placing of ASO and LRM items. As regards the LRM factor, counsellor educators considered these items much more appropriate than did the principals and counsellors. Principals found LRM items the least appropriate for discussion. Counsellors rated them higher and counsellor educators considered them still more appropriate than counsellors did.

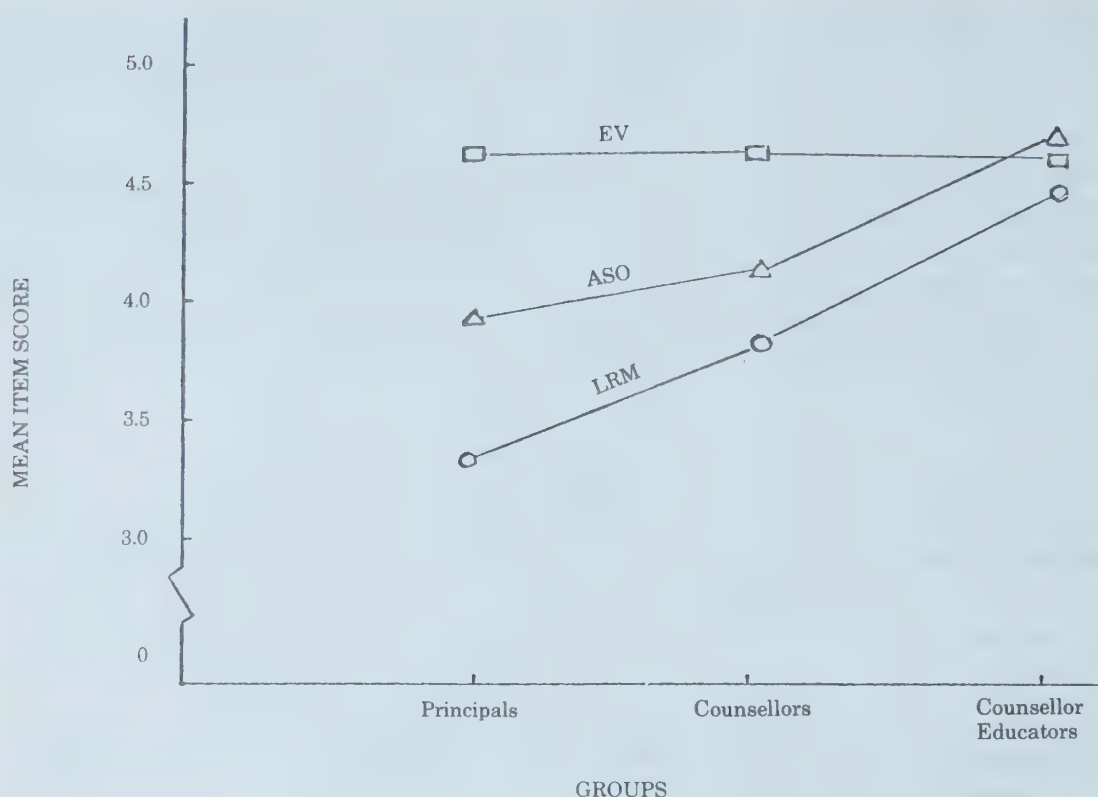


Fig. 1. Mean item scores for three groups on each of three factors. (EV=Educational-Vocational problems; ASO=Adjustment to Self and Others; LRM=Love, Religion and Morality problems).

In summary, counsellors and principals differed to a greater extent than did counsellor educators in their view of the appropriateness of each factor and placed the items in this order: EV, ASO, LRM. Counsellor educators ranked ASO, EV, and LRM in order of appropriateness with no significant differences between factors.

Discussion

The findings revealed a significant difference among counsellors, counsellor educators, and principals in their judgment of the appropriateness of two different areas of discussion with students in a counselling situation. A consensus appeared in only one area among the three groups regarding the function of a counsellor in Alberta high schools. They all agreed that it is appropriate for counsellors to deal with the Educational-Vocational (EV) problems of high school students, but agreed less on the validity of discussing problems about Adjustment to Self and Others (ASO) and Love, Religion and Morality (LRM). Since counsellor educators viewed the counsellor's role as including ASO and LRM problems in addition to EV concerns, they may very well be attempting to prepare counsellors for a role which is not possible for them to fulfill in many schools. Hart and Prince (1970) concluded from their study of principals and counsellors in the Utah secondary schools that school counsellors were taught many role philosophies and behaviors that are in conflict with the expectations

of principals. Perhaps we should be asking if the counsellor education programs are too idealistic since the counsellors after training are finding different job demands in the schools. It might be better still, however, to ask if there are not new ways to effectively acquaint principals with the importance of this ideal counsellor role so that they may better understand it and adopt appropriate expectations.

It appears that all groups are quite willing to allow counsellors to deal with educational and vocational guidance, but there are many reservations regarding the discussion of specific problems of LRM, or even of ASO. In an additional note attached to their returned questionnaires, some counsellors and counsellor educators stated that they would like to refer students who bring up such topics to the specialists hand, such as chaplains and marriage counsellors who could deal more adequately with these problems. Others stated that they want the student to determine the problem: any topic he brings up in a counselling interview is an appropriate one for discussion, or at least for "listening" on the counsellor's part. These counsellors would appear to be in accordance with the view that the counsellor's primary responsibility is always for the student and his needs.

An interesting difference was noted in the present study regarding the three factors resulting from the factor analysis of the Warman Check-List. Warman, as well as Ogston, Altmann, and Conklin (1968), found Vocational Choice (VC), College Routine (CR), and ASO to be the three factors into which the items fell. This present research found that the educational and vocational area was covered by one factor, EV, while the personal area was subdivided into a non-threatening personal and interpersonal relationship factor, ASO, and a factor relating to problems of love, sex, religion, and morality, LRM. It might be interesting to speculate on reasons for this difference in factors and conduct research in an effort to clarify the factor structure of the Warman scale.

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MICHAEL J. A. HOWE

The University of Alberta

and

PATRICIA M. CAVICCHIO

*Tufts University School
of Dental Medicine*

Retroactive Interference in A Meaningful Learning Task

Retroactive interference has been observed in a number of verbal learning tasks, but not in classroom learning situations requiring non-verbatim recall of meaningful structured material. The present experiment tested the prediction that retroactive interference would occur when students had not only to read but also to recall similar materials interpolated between presentation and reproduction of a meaningful prose passage. The 96 young adult female subjects formed 4 experimental groups in a 2 x 2 design. The independent variables were similarity to the original passage of the interpolated materials (similar-dissimilar) and the recall instructions for them (recall-no recall). The effects of neither variable were significant, and it was concluded that no evidence exists for retroactive interference in learning tasks requiring substantive reproduction of meaning verbal subject-matter.

Introduction

There have been numerous demonstrations of retroactive interference in verbal learning experiments, and the authors of a number of textbooks on Educational Psychology (e.g. Andreas, 1968: 81; Bigge & Hunt, 1968: 465; Blair, Jones & Simpson, 1968: 233-234; Edwards and Scannell, 1968: 343; Macdonald 1965: 239; Mouly, 1968: 365) have referred to this phenomenon, with explicit or implicit suggestions that retroactive interference may be an influential variables in classroom learning. Macdonald (1965), for instance, states that: "In general, the teacher should expect students to have difficulty retaining highly similar materials which are learned in close proximity to each other."

Ausubel, Stager & Gaite (1968), however, while admitting the validity of retroactive interference for verbal learning in studies using meaningless and unconnected materials, express doubt as to whether it occurs when

materials are meaningful learned, and studies by Ausubel and his associate (Ausubel, Robbins & Blake, 1957; Ausubel, Stager & Gaite, 1968) and others (e.g., Hall, 1955; Mehler & Miller, 1964) show that when meaningful connected verbal passages have to be recalled no retroactive interference occurs, except in situations requiring verbatim recall. Thus there appears to be no firm evidence of retroactive interference in the sort of class situation whereby meaningful learning takes place.

Yet it is noticeable that in all the above studies which failed to show evidence of retroactive interference, the interpolated similar materials were provided by the experimenter rather than by the subjects, and the latter did not at any stage have to produce or reproduce these interpolated items. In many classroom learning situations the learner himself provides similar interpolated materials, and it is conceivable that there may be retroactive interference when a subject provides or recalls items that are similar to the original verbal passage. Results obtained by Kay (1955) and by Howe (1970*b*) indicate this to be a reasonable suggestion. In these studies students were required to make repeated attempts to recall meaningful prose material, and there were repeated presentations of the correct version. The results of both experiments indicate that subjects' early recall attempts very strongly influence their later reproductions. Although a presentation of the correct version occurred between each attempt at recall, the content of each attempt was extremely similar to the previous one, the errors as well as the correct material being repeated, and a number of the subjects in Howe's (1970*b*) study spontaneously remarked upon their surprise and frustration at the limited extent to which they found themselves able to profit from the repeated presentations of the correct material, to modify and improve the accuracy of the remembered version. It appears that recall drew upon relatively stable versions of the material as processed and coded by each individual subject, and that those parts of the processed versions that were incorrect interfered with retention of the correct information. Additional evidence for the effects of learner-produced reproductions upon subsequent retention of prose material is available from studies of notetaking (Howe, 1970*a*; *in press*).

These results are consistent with the suggestion that retroactive interference may occur in school situations where interpolated material is both similar to the meaningful verbal passage being learned, and is produced by the subject himself. The present experiment was designed to examine this possibility. Briefly, subjects were required to read prose material, then they read similar or dissimilar passages, and next either recalled the interpolated material or read other (entirely different) passages, and finally attempted recall of the original. It was predicted that, in line with the results obtained by Ausubel, Robbins & Blake (1957) and Ausubel, Stager & Gaite (1968), when subjects had to read but not reproduce similar interpolated material, recall of the original passage would not be inferior to recall in the condition whereby the interpolated material was dissimilar. On the other hand, when subjects had not only to read but also to reproduce the interpolated passage, interference related to similarity was predicted. This would lead to recall of the original

prose passage being less accurate following reproduction of similar interpolated material than in the condition where the reproduced interpolated material was dissimilar to the original version.

Method

Subjects

The subjects were 96 young women (Mean age 19 years) who were enrolled in a one-year course at Tufts University Dental School, studying to be dental assistants. The subjects were tested in 4 approximately equal batches, and within each an equal number were assigned to each of the 4 experimental conditions.

Experimental Design and Materials

A basic 2 x 2 design was used in which the independent variables were similarity (similar, dissimilar) of the interpolated material to the original prose passage being learned, and activity succeeding presentation of the interpolated passage (recall passage, read different material). The original passage was a set of instructions of lifesaving by the Chest Pressure Arm Lift (Silvester) Method, and was approximately 200 words in length. The similar interpolated passage was of equal length, style and structure, and consisted of lifesaving instructions using the Back Pressure-Arm Lift (Holger-Nielsen) Method. The dissimilar interpolated passage contained instructions for making a vanilla souffle, and was equal in length to the other materials. The subjects who were not required to recall the interpolated passage spent the recall period reading a 2500-word extract from a story by Kafka ("The Metamorphosis"), which was highly dissimilar to any of the other materials used.

Procedure

After listening to instructions subjects were handed sheets containing the original passage, and were allotted 5 minutes in which to study it. Then they returned the sheets and were provided with a second passage which they were also told to read. For half of the subjects this passage was similar to the original, and for the others it was dissimilar. These materials were in turn collected and half of the subjects in each of the similar and dissimilar groups received instructions to attempt written recall of the second (interpolated) passage, while the others received the additional (dissimilar) reading matter. The duration of this period was 10 minutes. Finally, all four experimental groups were handed blank sheets of paper, and they were told to write as much of the content of the first passage as they could remember. To prompt recall the title of the passage ("The Chest Pressure Arm Lift (Silvester) Method") was provided. Ten minutes were allowed for written recall.

Scoring

For scoring recall the passage was divided into 20 successive segments containing non-trivial meaningful content, and guidelines were provided specifying the minimum data that were judged as being acceptable in conveying the essential elements of meaning in the segment. This method of scoring meaningful recall was partly based upon procedures devised by Cofer (1941) and had been used by the senior author in a recent study

(Howe, 1970b), with materials similar in length and structure. Since the product moment correlation for scores between difference judges was +.89, it was considered that the method of scoring meaningful recall was sufficiently reliable for the present experiment.

Results

The mean numbers of meaningful items correctly recalled (out of 20) were as follows: Similar Interpolated Material, Recall Required, 12.75 items; Similar Interpolated Material, Recall Not Required, 12.25 items; Dissimilar Interpolated Material, Recall Required, 13.62 items; Dissimilar Interpolated Material, Recall Not Required, 13.41 items. Neither of the independent variables had a significant effect. For the Similar-Dissimilar (interpolated material) variable $F = 1.78$, $df = 1/92$, and for Recall-Non Recall (of interpolated material) $F < 1$, $df = 1/92$. There was no significant interaction between the effects of the two variables, $F < 1$, $df = 1/92$.

Discussion

The present results supports those obtained by Ausubel, Robbins & Blake (1957) and Ausubel, Stager & Gaite (1968) in finding no evidence that similarity of interpolated material which subjects were required to read but not reproduce affects meaningful recall of substantive prose material. In contrast with the prediction, even when similar interpolated materials did have to be reproduced, there was no measurable retroactive interference. It would seem that the findings of Ausubel and his colleagues can be extended to situations that require active recall of interpolated similar items. There is no evidence that retroactive interference occurs in situations requiring retention and meaningful (rather than verbatim) recall of structured prose material.

It is difficult to explain the apparent discrepancy between the present results and those obtained in the earlier studies by Howe (1970b) and Kay (1955). In both of these it appeared that factors related to the processing of materials underlying early incorrect attempts at recall of a prose passage interfered with subsequent retention of the correct version. The most likely explanation is that such interference occurs solely in relation to specific materials that a learner is attempting to retain.

There are certain school learning situations where retention is almost inevitably of a rote or unstructured nature. This is the case in some facets of foreign language acquisition, and in such instances it is quite conceivable that retroactive interference phenomena can exert an influence upon performance at learning tasks. However, the present findings provide no indication that retroactive interference occurs to any noticeable extent in the more highly structured and meaningful situations encountered in classroom learning. One should add that in the research literature on this area there is an implicit assumption that learning is either meaningful or rote, structured or unstructured. In fact these are continuous variables, and the exact values of them at which retroactive and proactive interference begin to occur remain to be found.

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B. L. HICKS,
University of Illinois

S. M. HUNKA, and
T. O. MAGUIRE,
The University of Alberta

and

D. SAWADA
Pennsylvania State University

Instructional Applications of The Computer —An Experimental Course¹

In the spring of 1969 an experimental course entitled "Instructional Applications of the Computer" was offered for the first time to education students at The University of Alberta. In the accompanying paper, the course is described in terms of objectives and activities. A description of the students who participated in the course is also given and the results of their evaluation of the course are presented. A revision of the course was offered in the first term of 1970 and a preliminary evaluation of the revision is given.

Introduction

Of the few courses about computer-assisted instruction (CAI) that have been taught in Canada or the United States, most were for graduate students. Each course was directed toward some useful educational objective but none represented a goal we think is also important, that of ultimately equipping all education students with an understanding of CAI and its relationship to teaching.

In the 1969 spring term, an experimental course for undergraduates about computer-assisted instruction (CAI) was undertaken at The University of Alberta. The course, which was called "Instructional Applications of the Computer", was based in part on the class notes developed during the previous term by one of the authors (B. L. Hicks) while on sabbatical leave from the University of Illinois. Because the course was a pioneering venture and because the authors and the students analysed the value of the course rather carefully, it is felt that this account may be useful to others who are thinking of starting a course about CAI for undergraduates.

¹ We should like to acknowledge the help of several who worked with us and with the students on the course: T. Kieren, A. D. Fisher, R. H. Hughes and J. E. Couture. Miss Diana Gibbons assisted in the analysis of the course. The Division of Educational Research Services and the Carnegie Corporation supported the work of B. L. Hicks on the course during the spring term.

General Description of the Course

The course was chiefly concerned with computer-assisted instruction and its use by the teacher in conjunction with other ongoing teaching-learning activities.

Proper use of CAI in the schools will directly benefit instructional processes in education. But there will also be indirect benefits of the use of computers in the schools by students and teachers. Schools of the future will apply computers not only for purposes of instruction but also in many other ways, for example, in scheduling, in maintaining school records, and in counselling. Like other citizens, students and teachers live in a society that is now and will, even more in the future, be affected by the computer and its technology. As students see the usefulness (and the limitations!) of computers in instruction and in other school activities, they will learn much about the role of the computer and its technology in society.

Computer-assisted instruction, because it is designed to serve the complex processes of instruction and learning, is itself a complex subject whose rational development has only been started. A serious treatment of the subject therefore makes unusual demands both of the students and of the professors in a CAI course. It would be a mistake to gloss over this complexity even in the present introductory course. But an attempt was made to avoid the fate of so many specialists who, in trying to make a contribution to education, succeed only in elaborating their own specialty in a slightly new context. No presentation of the specialized findings of all those who have worked in computer-assisted instruction was made. Instead, many of the practical and deep questions about computer-assisted instruction and its relation to other means of instruction were investigated. Many of the questions were left unanswered, but in the process of asking and trying to answer them a common language was developed by professors and students, suitable for a serious discussion of computer-assisted instruction.

The course was meant for those who are teachers or are soon to become teachers in elementary and secondary schools. It was designed to explore enough about the nature of this remarkable new educational tool, computer-assisted instruction, so that teachers will be able to help develop and manage it in the schools of the future. The course was not designed to train computer programmers, though the authors are convinced that many of the questions dealt with in the course should be thought about seriously by anyone, programmer, teacher, curriculum specialist, parent, or educational administrator, who will in the future have a direct hand in managing or designing the use of CAI in the schools. It was expected that the course would persuade some teachers to go into programming and some programmers to appreciate educational applications of computers, two desirable outcomes, though not the primary goal of the course.

If there was one inclusive purpose behind this course, it was to enhance the creative and critical faculties of the future teachers in using and managing a new educational tool. Therefore the nature of CAI systems

and how they are created were reviewed first. An effort was made not to adhere to any one educational theory nor to any one philosophy of computer use in education. A variety of CAI materials were then evaluated, in student-faculty teams. Indeed, student-faculty involvement was sought throughout the course. Once they grasped the essential nature of CAI and its potential uses in education, the students could make the decisions about just what CAI materials and programs would be evaluated and how the task could be approached by the student-faculty teams. The students therefore found in this course both freedom and responsibility as they endeavored, jointly with members of the faculty, to enlarge their creative and critical faculties. It is hoped that these future teachers will remember the value of student involvement when they come to deal with students in the primary and secondary schools.

Class Composition

More than thirty students applied to take the course. Most of them had just finished bachelor degrees in arts or science and were in the first year of a teacher preparation program. Sixteen were chosen to form a class which would have a varied background. The class was composed of:

- (a) students representing seven different areas of specialization (mathematics, physical, biological and social science, English, business education, and physical education),
- (b) students in both elementary and secondary education, and
- (c) students with experience in computer science and those without this experience.

In this first experiment with a course about CAI for undergraduate education students it was decided to work with one class of moderate size so that instruction could be informal and there could be close student-faculty contact in the teams working outside the class.

Course Activities

During most of the class sessions three out of the four faculty advisors were present.

The term was divided into three sections. The first section of four weeks introduced the students to the essential concepts of CAI, through readings, class discussion and experience on two CAI systems in the CAI laboratory of the Division of Educational Research Services, The University of Alberta. During the second section of seven weeks, which coincidentally included the three weeks of student teaching, the students met in small teams with their faculty advisers to develop joint reports on a major problem of interest. In the third section of two weeks the reports were finished and discussed thoroughly in class.

The topics treated in class included the following:

1. Sharpening perceptions of teacher behavior,
2. Comparison of instruction in the classroom and on CAI,
3. The Community Computer-Based Educational System—a complete CAI System,

4. Some elements of instructional programming, and
5. Critical review of articles and reports.

Reading in the CAI literature were available to the students in a special file and were supplemented by a number of handouts in class that were related to the above topics, to the long term assignments, or to the laboratory exercises. The readings and four of the handouts are listed at the end of the present paper.

The principal assignments were:

1. Preparation of a paper of not more than 2000 words describing either:
 - (a₁) an ideal teaching environment, or
 - (a₂) teaching activities considered to be uniquely humanand (b) resources needed for an effective teaching environment,
 - (c) probable CAI-induced changes in school plant, personnel and administration, and
 - (d) questions about CAI that should be considered in class during the term.

The paper was submitted in the fourth week of the term.

2. Participation in one of the team projects leading to a written report that was presented and discussed in class. The seven projects were:
 - (a) Analysis of Student Response—Recognition of Correct Answers.
 - (b) Analysis of Student Response—Implications for Pedagogy and Learning,
 - (c) Analysis and Evaluation of the Demonstration Program developed by the Division of Educational Research Services, University of Alberta, for the IBM 1500.
 - (d) Implementation of a Large CAI System in the Province of Alberta,
 - (e) CAI Applications in Social Science (Meteorology),
 - (f) CAI Application in Social Science (Economics), and
 - (g) Native Education in Northern Alberta.

In the laboratory phase of the course the students made use of two CAI systems: (a) the 2741 typewriter terminals connected to the IBM 360/67 computer; and (b) the IBM 1500 System. Each student used both systems in studying DRILL 1, a CAI program illustrating many aspects of instructional programming. Each student interacted with the demonstration program developed for the 1500. One group of students analyzed the package much more thoroughly as part of their term project.

Comments and Conclusions

Several opportunities for student feedback were provided both formally and informally. From that source and from the observations made by the staff during the course a number of strengths and weaknesses were noted. The informal intensive student-faculty interaction in and out of class was seen as beneficial. The staff student ratio of four to sixteen, would be unrealistic for a regular course. However, the students may have been reacting as much to staff accessibility as to the number of staff involved. A second strength noted by the students was the opportunity for making frank comments on the course. Clearly, all suggestions could not bring about changes in the course direction, but an attempt was made to use

the feedback to modify the course. A third general strength was the class project which allowed the students to be creative, to be critical and to take responsibility for a segment of the course.

A second set of strengths derived from the topics and activities. The students were stimulated to take an informed interest in the promise and problems of CAI. They realized that the most important questions in evaluation of CAI are educational questions, not those of hardware and software. By studying and assaying the potential of CAI, the students became more precise in their conception of the problems of education in general. A particularly good procedure for developing this precision was the simulation of a computer and of a teacher by one of the staff, when each performs only the instructions defined specifically by the class. This had the additional outcome of generating a good deal of respect for the complexity of the teacher as an information processing system.

A final activity which was deemed useful was the opportunity to observe the performance of children working at CAI terminals. Under such circumstances it was apparently easier to put oneself in the children's position from certain strengths and weaknesses of CAI in general and the demonstration program in particular become obvious, when they would not have been otherwise.

Not all of the feedback was laudatory; several weaknesses were noted. The most serious early weakness was that the goals of the course were not clearly spelled out to the students. Thus some of the students were unsure of what was expected of them. This problem was compounded by inadequate checking and discussion of the reading done by the students. As a consequence, the instructors tended to assume a greater knowledge on the part of the students than they actually had. Another weakness was in the sequencing of hands-on experience with CAI systems. Whereas it should have been one of the early activities, it was delayed until mid-way through the course. The course was designed for use in institutions where CAI systems are not available. However, in situations where systems exist, delaying experience with the system becomes a source of frustration to the students.

A different weakness resulted from the selection of students to affect a balance between students with computer experience and those without. It was hoped that the two groups would be supportive of each other. Instead their interests tended to split the class into two groups. The students with computer experience tended to be oriented toward hardware and programming, whereas the other students were more concerned with the social issues related to CAI implementation. This problem could be overcome by forming project groups along lines which place individuals with complementary skills in the same group. In the trial course, project groups were formed on a volunteer basis.

A final weakness was that there was not nearly enough time for the projects, and in fact for the whole course. This was due to the loss of three weeks for practice teaching. A full semester is necessary to achieve the kinds of understandings anticipated by the instructors.

During the first semester of 1970 the CAI course was tried again with enrollments coming primarily from students in the third and fourth

years of the Faculty's education program. One problem previously voiced by the students, the fact that early experience in the use of the CAI system was not provided, was corrected. In addition, all students were asked to learn how to program the IBM 1500 computer using Coursewriter II by following a set of laboratory exercises. Some opportunity was made available for students to view other instructional programs authored by more experienced teachers and authors. As background to the construction of CAI lessons a review of how to define educational objectives and learning theory was attempted. Once the students had completed a major portion of the laboratory problems, a cursory picture of how the computer system operates was given.

For about one-quarter of the students one semester was insufficient time to adequately cover all the work assigned, with the result that some of the more important readings were not covered. The laboratory problems used to introduce the student to Coursewriter II were considered to be too sterile, i.e., each problem could not be used as a basis by accumulation to produce a small course by the time the last problem was completed. Some students did however go far beyond the material covered in class and actually constructed sophisticated course sequences. Part of this was probably due to having placed some of the course material on the computer itself for teaching to the students at their own speed and time. The chance to view the work of other authors was well received since it provided a concrete example of the computer's potential as well as how others had organized their course content. The cursory introduction to what the computer must do 'behind the scenes' was also well received and gave the students a better appreciation for some of the technical problems associated with a time-sharing CAI system.

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- (a) Will the Computer Kill Education? (B. L. Hicks). To be published in *The Educational Forum*.
- (b) Rationale for Research on Experimental CAI Courses for Teachers (B. L. Hicks).
- (c) Definitions in CAI.
- (d) A Short Guide to Critical Evaluation of CAI Literature.

BOOK REVIEWS

EDUCATIONAL IMPLICATIONS OF PIAGET'S THEORY.

By Irene J. Athey and Duane O. Rubadeau (Editors). Waltham, Mass.: Ginn-Blaisdell, 1970.

Although Jean Piaget was born in 1896, and although he has long since completed most of the work which is now receiving so much attention on this continent, he has relatively suddenly become a hot prospect among publishers. Indeed, the impact of Piagetian theory on child psychology, on research in development, and on educational practice is quite phenomenal. It is hardly surprising, therefore, that beginning with Flavell's book in 1963 most of the major publishers have now produced at least one text which attempts to explain complicated Piagetian theories to unsophisticated students of psychology and of education. The appearance of a book such as Athey and Rubadeau's is also, therefore, no great surprise. Nor, unfortunately, is it likely to create much of a stir in teacher-education circles.

True, the book provides an excellent collection of articles which report research based on Piaget's theories and at least in some way related to the classroom. Indeed, most of the names that have come to be associated with Piagetian research on this continent are represented in the text. This is almost inevitable since the book contains forty-one articles—yet it is only a 376 page paper back (including the bibliography). The large number of articles in so few pages has been made possible by editing and abridging many of the articles—a feature which might appeal to the Piagetian researcher, but which is not likely to improve the clarity of the material for the reader who is not already well versed in both Piagetian terminology and contemporary research methodology. This is likely to be the major disadvantage of this text as it competes with others at the undergraduate level in education. There is little doubt that those books which are not collections of *research* articles, but which are directed toward elucidating the educational implications of Piaget's work will fare far better in this market. This is particularly true since the authors make little or no attempt to explain the articles which are reprinted in the text, or to integrate them by relating them to one another or to a central theme.

On the other hand, more advanced (graduate) students, and researchers in the field who are not already familiar with the readings collected here, might profit considerably from its use as a sourcebook. Among its advantages in this role are its excellent bibliography, the fact that most of the extraneous material has been deleted from the articles, and the organization of content by area (ie.—general implications, implications for early childhood education, for the educationally handicapped, for language and art, for science and mathematics, and for test development).

In summary then, while the book does represent a well organized and comprehensive collection of Piaget-cum-education based articles, since these are frequently abridged and since the authors provide little explanatory comment, the text is likely to prove much too difficult for the person

who should be most concerned with Piaget and the classroom—the teacher. On the other hand, researchers and instructors in teacher education institutions will find it a valuable sourcebook.

GUY R. LEFRANCOIS
The University of Alberta

LANGUAGE AND THINKING IN THE ELEMENTARY SCHOOL

By E. Brooks Smith, Kenneth S. Goodman, and Robert Meredith. New York: Holt, Rinehart and Winston, 1970. 376 pp.

Although many advances have been made recently in the disciplines which examine language, these advances have not always been reflected in instruction in language in the elementary schools. At present the gap between what is known about language and language learning and what is taught in the schools under the guise of a language program is creating considerable tension. Smith, Goodman and Meredith have attempted not only to integrate knowledge from a diverse array of disciplines concerned with language, but also to construct a theory of language instruction which is congruent with the resulting integration.

The authors put forward the concept of a language-centered' approach to teaching and learning. In this view, education is a process of "trying to put the world together" (p. 81) by means of symbolic transformation of experience. This process is seen to involve three phases: (1) Perceiving new data in the environment, (2) Ideating upon the perceptions, (3) Presenting ideations to one's self and others. Language is considered to play an integral role in this process both as a means of presenting one's ideations and as a means of manipulating one's perceptions of the world. While this view is strongly cognitively oriented, the authors do not overlook the importance of non-cognitive factors, such as affect, in language. Discussion of instructional strategies in the book are related to the above three phases of "coming to know" in a language-centered education.

The discussion of school programs in language follows directly from the more general concept of language-centered teaching and learning. Indeed, it is one of the strengths of this publication that instruction in language is related to a larger view of education and of language development. The program put forward envisages an attempt to diagnose students' needs and strengths in language and an attempt to develop ideation in widening experiences with children thereby forcing an expansion of the language already present. The authors hope in this way to continue developmental trends already present prior to school entry. They feel that the child's own language has been the least used resource in language instruction (p. 163). Knowledge about language in this program is valued only as it contributes to effective, flexible language use. In brief, the emphasis is upon providing experiences which provoke interpretation and thereby expand language proficiency.

The authors discuss each of the traditional areas of language instruction, such as oral and written communication, (or speech-thought and written-thought as they are called), reading, literature and the other areas in the light of their position. While it is true that much space is devoted to the discussion of possible teaching strategies and techniques, much of this discussion is at a very general level and appears to assume a reader with some teaching experience.

Too often language publications imply that the good language teacher is the one who smiles sweetly and reads poetry with vibrant enthusiasm. In their attempt to see language instruction as integral to the child's creation and interpretation of his world, Smith, Goodman and Meredith have broken tradition with this "sweetness and light" genre of language publication. The attempt to influence the language-thinking skills of young learners demands considerable knowledge of language and language learning as well as the subtle ability to help the child focus upon his experience in an attempt to create a personal symbolic interpretation.

The authors have ranged far and wide through the disciplines concerned with language. They have incorporated ideas from such fields as linguistics, psychology, psycholinguistics, semantics, and the philosophy of language. While knowledge of all of these disciplines is required if language is to be considered in any depth, the attempt to cover the field often leads to superficial consideration of important issues. An example of one such issue is the sketchy discussion of the differences between oral and written languages.

The section dealing with reading appears to adequately summarize the work of Goodman which had been published previously throughout a variety of journals. Unfortunately few new ideas are introduced and this section appears strangely unrelated to the remainder of the book.

The book appears to be an ambitious undertaking which, while it has not entirely achieved its goal, is a worthy addition to the field of language publications. The book will probably appeal to students and teachers with some background in language instruction, particularly those with a cognitive orientation. In addition, those interested in research may find some interesting opinions expressed which appear amenable to research.

R. K. JACKSON

The University of Alberta

NOTES ON CONTRIBUTORS

HAROLD A. ALTMANN is currently Associate Professor in the Division of Counselor Education at the University of Calgary. He holds the degrees B.Sc. from Mankato State (Minnesota), M.Ed. from Colorado State, and Ed. D. from the University of Wyoming. Dr. Altmann has had experience as a teacher, counselor, and school administrator. Previous publications include articles in *The Journal of University Student Personnel Services*, *The Canadian Counsellor*, *The Journal of Counseling Psychology*, *Western Psychologist*, and *The Journal of College Student Personnel*.

PATRICIA M. CAVICCHIO is presently Dental Hygiene Consultant, U.S. Public Health Service. Previously Mrs. Cavicchio was Director of Auxiliary Personnel, Tufts University School of Dental Medicine, Boston. Mrs. Cavicchio, who holds the degrees B.S. and M.Ed. from the Tufts University of Massachusetts, has published articles in the *Massachusetts Dental Hygienist Association Bulletin* and the *Journal of American Dental Health Association*.

R. C. CONKLIN holds the degrees B.A., M.Ed., and Ph.D. from The University of Alberta. He is presently Associate Professor in Educational Psychology at the University of Calgary. Previous publications include articles to this Journal and other journals in the field of counseling psychology.

ROGER A. CORMIER holds the degrees B.A., B.Péd., and L.Péd. (Adm. Scol.) from the University of Montreal, and Ph.D. (Ed. Adm.) from The University of Alberta. Dr. Cormier has had experience as a teacher of elementary schools and in the insurance business. He is presently Assistant Professor at the University of Montreal.

LESLIE R. GUE is Associate Professor of Educational Administration at The University of Alberta and is Training Director of the Thailand Comprehensive School Project. Dr. Gue is Chairman of the Intercultural Education Committee of the Faculty of Education and is a member of the Staff-Student Relations Committee of the same Faculty. Previous publications include articles in *The Northian*, and *Proceedings of the Phi Delta Kappa International Relations Conference, 1967*.

HELEN HENGEL is a Counsellor with the Student Counselling Services, the University of Calgary. Miss Hengel has had previous experience as a teacher in elementary and high schools and was a Principal of Radville High School, Saskatchewan.

A. B. HERMAN is Associate Professor at the University of Calgary. He has had experience as a teacher in Alberta and was Principal of Bentley High School, and was Director of Guidance Services and Special Education for the County of Lacombe. Previous publications include articles in the *Canadian Counsellor*, and *Readings in Human Relationships*, of which Dr. Herman is co-editor.

BRUCE L. HICKS is presently Professor of Secondary and Continuing Education at the University of Illinois. Dr. Hicks has presented papers and reports in applied physics and computer science. He has also published widely on the application of computers to education and is co-author with Dr. Hunka of *The Teacher and the Computer: A Text on Computer-Assisted Instruction*.

MICHAEL J. A. HOWE is Associate Professor of Educational Psychology at The University of Alberta. He holds the degree Ph.D. from the University of Sheffield, and has held appointments at Dalhousie and Tufts Universities. Previous publications include articles on Memory, and Human Learning and a book, *Introduction to Human Memory*.

S. M. HUNKA holds the degrees B.Ed., M.Ed., from The University of Alberta and Ph.D. from the University of Illinois. He is presently Professor and co-ordinator of the Division of Educational Research Services at The University of Alberta. Previous publications include articles to the *Review of Educational Research*, *Harvard Educational Review*, *Journal of Medical Education*, and *British Journal of Mathematical and Statistical Psychology*. Dr. Hunka is presently co-authoring a text entitled *The Teacher and The Computer*.

ROBERT K. JACKSON is Assistant Professor in the Department of Elementary Education at The University of Alberta. He holds the degrees B.Ed., from McGill University and M.Ed., and Ph.D., from The University of Alberta. Dr. Jackson has taught in the Province of Quebec and has been an administrator in Alberta schools.

GUY R. LEFRANCOIS is Associate Professor of Educational Psychology at The University of Alberta. He is interested in the work of Jean Piaget and has published articles in this Journal, and *The Canadian Journal of Psychology*. Two books by Dr. Lefrancois, *Psychological Theories of Human Learning: Konger's Report*, and *Educational Psychology*, will be released in 1972.

THOMAS O. MAGUIRE is Associate Professor of Educational Psychology at The University of Alberta. Dr. Maguire holds the degrees B.Sc., B.Ed., and M.Ed., from The University of Alberta and Ph.D., from the University of Illinois. His research interests are in the areas of scaling, experimental design and curriculum evaluation.

CHARLES E. PASCAL holds the degree Ph.D., from the University of Michigan. He is presently Assistant Professor in the Psychology Department and the Centre for Learning and Development at McGill University. He has published articles on student choice, individual differences, evaluation, grading, and other aspects of the teaching-learning process.

D. SAWADA is Assistant Professor of Elementary Education at The University of Alberta. Mr. Sawada is presently on leave to study for a Ph.D. in Mathematics Education at the Pennsylvania State University. Previous publications include articles in this Journal and in *The Arithmetic Teacher*.

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